

**FOURTH FIVE-YEAR REVIEW REPORT FOR
RALSTON SUPERFUND SITE
LINN COUNTY, IOWA**



**Prepared by
U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas**

**MARY
PETERSON** Digitally signed by MARY
PETERSON
Date: 2021.06.28
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**Mary P. Peterson, Director
Superfund and Emergency Management Division**

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LIST OF ABBREVIATIONS & ACRONYMS

AOC	Administrative Order on Consent
ARARs	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COCs	Contaminants of Concern
DCE	Dichloroethene
DVE	Dual Vapor Extraction
EPA	U.S. Environmental Protection Agency
FYR	Five-Year Review
IDNR	Iowa Department of Natural Resources
MCLs	Maximum Contaminant Levels
NPL	National Priorities List
O&M	Operation and Maintenance
PFAS	Per- and Polyfluoroalkyl Substances
PRP	Potentially Responsible Party
RAO	Remedial Action Objectives
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SLERA	Screening Level Ecological Risk Assessment
TCE	Trichloroethylene
UU/UE	Unlimited use and unrestricted exposure
VISL	Vapor Intrusion Screening Level
VOCs	Volatile Organic Compounds
µg/L	micrograms per Liter

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy to determine whether the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fourth FYR for the Ralston Superfund Site. The triggering action for this statutory review is the completion date of the previous FYR. This FYR has been prepared because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Ralston Superfund Site consists of one operable unit (OU01), which is addressed in this FYR.

This FYR was led by Diana Engeman, EPA Remedial Project Manager. Participants included Jessica Kidwell, EPA Hydrogeologist; Catherine Wooster-Brown, EPA Ecological Risk Assessor; Ann Jacobs, EPA Human Health Risk Assessor; Pamela Houston, EPA Community Involvement Coordinator; Jared Pessetto, EPA Attorney-Adviser; and Hylton Jackson, Iowa Department of Natural Resources (IDNR) Project Manager. The IDNR and Rockwell Collins were notified of the initiation of the FYR. The review began on June 24, 2020. Documents referenced during this FYR are listed in Appendix A.

Site Background

The Ralston Superfund Site (Site) is located north of 228 Blairs Ferry Road NE, just south of Dry Run Creek, and about ½ mile east of C Avenue on the north side of Cedar Rapids, Linn County, Iowa. Figure 1 shows the location of the Site. From 1956 to 1958, a waste contractor disposed of industrial wastes on his property. The contractor collected these wastes from Collins Radio Company and other local businesses. Rockwell Collins, Inc. was the successor to Collins Radio Company. Solvents and other debris were burned at the Site and small containers of cyanide wastes were encapsulated in concrete and buried.

The disposal area occupies 1.5 acres and is enclosed with a fence with a locked gate. The southern bank of Dry Run Creek forms the northern boundary of the disposal area. Figure 2 is a site map showing the location of the disposal area and monitoring wells. Rockwell Collins owns the disposal area and surrounding acreage. The area immediately surrounding the disposal area is zoned for residential/agricultural use. A walking/biking trail and commercial properties are within 500 feet of the disposal area to the south. They are separated from the disposal area by a steep, heavily vegetated embankment. Residential developments exist north and west of the disposal area. These developments have reached the property owned by Rockwell Collins. It is possible that there will be further commercial and residential development in areas outside the disposal area.

Several private and public water supply wells exist from within less than 1,000 feet to approximately one mile from the disposal area. Four private wells exist within one mile of the Site and are sampled

annually. The city of Marion utilizes one well that draws water from the Silurian aquifer approximately one mile east of the Site.

Detailed background information on the Site is available in the 1997 Remedial Investigation Report. That report included a site conceptual model.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Ralston		
EPA ID: IAD980632491		
Region: 7	State: IA	City/County: Cedar Rapids/Linn
SITE STATUS		
NPL Status: Non-NPL		
Multiple OUs? No	Has the Site achieved construction completion? No	
REVIEW STATUS		
Lead agency: EPA		
Author name (Federal or State Project Manager): Diana Engeman		
Author affiliation: EPA		
Review period: 6/24/2020 – 3/31/2021		
Date of site inspection: N/A		
Type of review: Statutory		
Review number: 4		
Triggering action date: 6/29/2016		
Due date (<i>five years after triggering action date</i>): 6/29/2021		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

In December 1981, Rockwell Collins submitted a CERCLA Section 103(c) notice to the EPA, which listed hazardous substances disposed at the Site as solvents, paint sludge and buried drums of concrete-encapsulated cyanide. In that notice, Rockwell Collins estimated that 60,000 gallons of liquid wastes were generated and disposed during the years of its plating operation, and an undetermined number of concrete-encapsulated cyanide drums were buried at the Site. Pre-remedial assessments and investigations conducted from 1985 through the mid-1990s detected volatile organic compounds (VOCs) and metals in soils; VOCs in shallow and bedrock groundwater, including a private water supply well; and low levels of VOCs in creek surface water and sediment.

In 1994, a baseline human health and ecological risk assessment was conducted as a part of the remedial investigation. Human exposures to contaminated surface soil, groundwater, sediment and surface water were evaluated in the baseline risk assessment. However, due to the subsequent implementation of removal actions and institutional and engineering controls, the only exposure pathways considered viable at the time of the 1999 Record of Decision (ROD) involved exposure to groundwater through ingestion or inhalation of vapors during household use by a resident. In the ROD, the following VOCs were identified as contaminants of concern (COCs) for groundwater: benzene; 1,1-dichloroethene (1,1-DCE); cis-1,2-dichloroethene (cis-1,1-DCE); trichloroethene (TCE); and vinyl chloride.

Although the baseline risk assessment identified potential ecological risks to site vegetation, the terrestrial food web, and the aquatic life in Dry Run Creek, the ROD stated that subsequent removal actions had significantly reduced or eliminated these risks.

Response Actions

Pre-ROD response actions at the Site included preliminary assessment and site investigation activities completed under the EPA's pre-remedial program, as well as voluntary actions by Rockwell Collins. In 1989, Rockwell Collins removed and properly disposed of two drums of concrete-encapsulated cyanide. No other drums were located.

On December 4, 1991, Rockwell Collins and the EPA entered an Administrative Order on Consent (AOC) to conduct a Remedial Investigation and Feasibility Study (RI/FS) at the Site. While Rockwell Collins was completing the RI/FS, they entered a second AOC, dated January 22, 1993, to conduct a removal site evaluation, an engineering evaluation/cost analysis and a removal action to accelerate the cleanup of the disposal area and shallow groundwater. The removal actions implemented at the Site included the following:

- Capping of the former disposal area;
- Stabilization of the bank of Dry Run Creek to prevent erosion;
- Installation and operation of a dual vapor extraction (DVE) and treatment system; and
- Extraction and treatment of alluvial groundwater located north of Dry Run Creek.

Capping of the disposal area and stabilization of the creek bank were completed in December 1995. Figure 3 shows the location of the disposal area cap and creek bank stabilization. The DVE and treatment system extracted both vapor and alluvial groundwater north of Dry Run Creek. The system began full-time operation in April 1995 and operated periodically until June 1997. At that time, it was determined that it was no longer effectively removing additional source contamination. More than 4,800 pounds of VOCs were removed and treated with the DVE and treatment system.

The ROD for the Site was signed on September 30, 1999. The ROD included remedial action objectives (RAOs) for soil and groundwater as follows:

- The RAO for soil was the prevention or minimization of direct contact exposures (inhalation, dermal contact, ingestion, etc.) with soil having a carcinogenic risk in excess of 1×10^{-4} or a hazard index for noncarcinogens greater than one. Specific soil cleanup criteria were not established in the ROD because the removal actions had eliminated exposure to soil that exceeded these threshold levels.
- The RAO for groundwater was to prevent exposure to groundwater containing contaminants that represent an unacceptable risk to human health or the environment; to contain the contaminated

groundwater plume; to restore the groundwater to drinking water quality outside of the disposal area; and to maintain site conditions which prevent exposure to residual soil contaminants that could pose an unacceptable risk to human health or the environment. This RAO was further described to prevent ingestion of or direct contact with groundwater having a carcinogenic risk in excess of 1×10^{-4} and/or a hazard index for noncarcinogens greater than one.

The selected remedy included:

- Monitored natural attenuation of groundwater;
- Continued ownership of the fenced-in area, including the disposal area;
- Continued listing of the site on the Registry of Hazardous Waste or Hazardous Substance Disposal sites pursuant to Iowa Administrative Code 455B.426;
- Continued designation of a protected groundwater source area surrounding the Site pursuant to Iowa Administrative Code 567-53.7(455B);
- Maintenance of the disposal area cap; and
- Maintenance of the Dry Run Creek bank stabilization.

The EPA's Maximum Contaminant Levels (MCLs) for public water supplies from the Safe Drinking Water Act were identified as applicable or relevant and appropriate requirements (ARARs) for this Site. The cleanup levels for groundwater at the Site were the MCLs, expressed in micrograms per liter ($\mu\text{g/L}$), as follows:

Table 1
Groundwater Cleanup Levels

Contaminant	MCL, in $\mu\text{g/L}$
Benzene	5
1,1-Dichloroethene	7
Cis-1,2-Dichloroethene	70
Trichloroethene	5
Vinyl chloride	2

It was noted in the ROD that achieving MCLs in the disposal area might not be possible due to the likelihood that contaminants were present in that area as a dense nonaqueous phase liquid and that in the future, if it were determined that MCLs cannot be achieved in the disposal area, it may be appropriate to consider a technical impracticability waiver.

Status of Implementation

On July 20, 2000, the EPA and the IDNR entered into an agreement entitled "Response Action Oversight and NPL Deferral Agreement for the Ralston Superfund Site, Cedar Rapids, Iowa." Pursuant to this agreement, the IDNR agreed to assume responsibility for oversight of the response actions at the Site and implementation of the ROD. Further, the EPA agreed to defer consideration of listing the Site on the National Priorities List (NPL), and when the response actions were complete, to no longer consider the Site for the NPL unless new information suggests the existence of a significant threat to human health or the environment.

On July 24, 2000, the IDNR entered Consent Order No. 00-HC-05 with Rockwell Collins. Pursuant to this agreement, Rockwell Collins agreed to perform the work prescribed in the ROD under the oversight of the IDNR.

Groundwater has been sampled semiannually in April and October from 2001 through 2005, and annually from April 2006 to the present. The two private wells closest to the Site have been sampled semiannually in the spring and the fall since 2001. Two additional private wells, further from the Site, have been sampled annually in the spring of each year since 2001.

The disposal area cap and the creek bank stabilization were inspected and maintained quarterly from 2001 through 2005. Since 2006, this inspection and maintenance has occurred semiannually.

Sediment and surface water samples were collected from Dry Run Creek in 2013 and again in 2020.

All institutional controls identified in the ROD have been implemented, and Rockwell Collins confirms annually that the institutional controls remain in place and no actions have taken place to adversely affect their effectiveness. The institutional controls include:

- Continued ownership by Rockwell Collins of the fenced area, including the disposal area. The area is zoned for residential/agricultural use. The only access to the disposal area is through a locked gate, thus restricting access by trespassers.
- Listing of the Site on the Registry of Hazardous Waste or Hazardous Substance Disposal Sites pursuant to Iowa Administrative Code 455B.426. Pursuant to Subrule 567, Iowa Administrative Code 148.6(5), written approval from the director of the IDNR is required prior to any substantial change in the use of the listed site. In addition, written approval is required to sell, convey, or transfer title of the listed site.
- A one-mile area surrounding the Site has been designated as a protected water source pursuant to Rule 567 Iowa Administrative Code 53.7(1)(455B). According to the promulgated rule, any new application for a permit to withdraw groundwater or to increase an existing permitted withdrawal of groundwater from within the protected water source area will be restricted or denied, if necessary, to preserve public health and welfare or to minimize movement of groundwater contaminants from the Site. The IDNR coordinates with the Linn County Health Department, the local well permitting authority, to enforce this institutional control.

Figure 4 shows the area designated as the protected water source area for the Site.

Systems Operations/Operation & Maintenance

No issues have been identified related to operation and maintenance of the remedy since the Third FYR. Modifications made to operation and maintenance plans since the Third FYR include sampling all monitoring wells for 1,4-dioxane at least once every five years and sampling surface water and sediment in Dry Run Creek for VOCs at least once every five years.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements, as well as the recommendations and the current status of those recommendations, for the most recent FYR and the Addendum to that FYR.

Table 2
Protectiveness Determinations/Statements from the 2016 FYR

OU #	Protectiveness Determination	Protectiveness Statement
01	Protectiveness Deferred	A protectiveness determination for the remedy at the Ralston Site cannot be made until further information is obtained. Further information will be obtained by sampling to determine whether 1,4-dioxane is present in groundwater and determining whether use of a well near the Site could affect the contaminated plume from the Site. It is expected that these actions will take approximately two years to complete, at which time a protectiveness determination will be made.

Table 3
Protectiveness Determinations/Statements from the 2019 FYR Addendum

OU #	Protectiveness Determination	Protectiveness Statement
01	Short-term Protective	Based on new information since the Third FYR completion date, the sitewide protectiveness statement for the Ralston Site is being revised as follows: The remedy at the Ralston Site is protective of human health and the environment in the short-term because engineering and groundwater use controls prevent unacceptable exposure to soil and groundwater. To be protective in the long-term, the EPA will continue to pursue implementation of a Uniform Environmental Covenant on the Rockwell property, sampling surface water and sediment in Dry Run Creek for the contaminants of concern at least once every five years, sampling groundwater for 1,4-dioxane at least once every five years, and continued monitoring and oversight of the use of wells within the protected groundwater source area.

Table 4
Status of Recommendations from the 2016 FYR and 2019 FYR Addendum

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
01	Use of well within protected water source area may have changed without evaluation of effect on contaminated plume.	Determine whether use of the well triggers the provisions of Chapter 53.	Completed	Use of the well within the protected water source area was evaluated, and it was determined it did not adversely affect the contaminated groundwater plume.	3/14/2019
01	Land use restrictions attached to the deed in the form of an environmental covenant have not been attached to the deed of the site property.	Implement an environmental covenant pursuant to the Uniform Environmental Covenants Act.	Addressed in Next FYR	PRP-property owner unwilling to implement environmental covenant. Will remain an issue in the next FYR.	N/A
01	Alluvial groundwater may discharge to Dry Run Creek.	Develop plan for periodic sampling of Dry Run Creek to determine whether surface water and sediment have been impacted by contaminated groundwater.	Completed	PRP committed in 2019 Annual Report, dated March 27, 2020, to sample sediment and surface water at least once every five years, with most recent sampling event occurring in June 2020.	5/7/2020
01	Determine whether 1,4-dioxane is present in groundwater.	Sample monitoring wells for 1,4-dioxane.	Completed	Groundwater was sampled in 2018 for 1,4-dioxane and found in MW-3B and MW-3C. PRP committed in 2019 Annual Report, dated March 27, 2020, to sample all groundwater monitoring wells for 1,4-dioxane at least once every five years.	3/14/2019
01	*Site monitoring plan and associated requirements require modification.	Update monitoring requirements to include: sampling surface water and sediment in Dry Run Creek for the contaminants of concern at least once every five years; sampling groundwater for 1,4-dioxane at least once every five years; sampling and	Completed	PRP committed in 2019 Annual Report, dated March 27, 2020, to sample sediment and surface water and sample groundwater for 1,4-dioxane at least once every five years.	4/2/2020

		observation of the use of wells within the protected groundwater source area.			
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* This issue was identified after completion of the 2016 FYR and included in the 2019 FYR Addendum.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification and Involvement

A public notice was made available by placing a notice in The Gazette newspaper on July 5, 2020, stating that a FYR was being conducted and inviting the public to submit any comments to the EPA. The EPA has not received any comments related to this FYR. The results of the review and the report will be made available electronically on the Ralston Site Profile Page.

Data Review

Groundwater

From 2001 through 2020, groundwater monitoring for COCs has been conducted semiannually to annually in monitoring wells and four private wells screened in multiple hydrogeologic units: Quaternary alluvium (MW-1A, -2A, -3A, -4A), Devonian carbonate bedrock (Lower Otis: MW-1B, -4B, -9B; Upper Bertram MW-2B, -3B), and Silurian carbonate bedrock (Upper Scotch Grove: MW-1C, -3C, -4C, Lower Scotch Grove: MW-1D, -3D, -5D, -7D, -8D, -9D; Hopkinton: MW-3E). In 2013, monitoring wells MW-10B and MW-11B were added to the Devonian monitoring network in response to potential plume delineation issues identified in the 2011 FYR. Appendix B contains a table of monitoring well analytical results since 1992. All data are presented annually in Remedial Action Activity Reports. Based on a review of groundwater monitoring information for the past five years, the vertical and lateral extent of groundwater contamination is now reasonably well delineated by monitoring wells. Later subsections of this FYR discuss the potential for contaminated groundwater to volatilize to indoor or outdoor air and to discharge to surface water and sediment at levels of concern via springs along Dry Run Creek.

Mean and trend tests were conducted for groundwater wells in which contaminant concentrations exceeded EPA MCLs during the FYR period. Annual groundwater data from the past eight annual monitoring events (2013 to 2020) were evaluated using the EPA Groundwater Statistics Tool. These analyses are summarized in Table 5.

Table 5
Summary of Statistical Analyses of Groundwater Monitoring Data

			May 2020 Ground water Result (µg/L)	Mean Ground water Result (µg/L)	95% Upper Confidence Limit on Mean (µg/L)	Trend	EPA MCL (µg/L)
Quaternary	MW-1A	TCE	1.59	2.93	6.45	No trend	5
	MW-3A	TCE	3,540	2,340	3,300	No trend	5
		1,1-DCE	160	127	205	No trend	7
		cis-1,2-DCE	18,600	14,100	18,000	No trend	70
		trans-1,2-DCE	65.6	103	150	Decreasing	100
		vinyl chloride	531	536	910	No trend	2
Devonian	MW-1B	TCE	3.66	12.3	18.5	Decreasing	5
	MW-2B	vinyl chloride	381	664	970	Decreasing	2
	MW-3B	TCE	93.9	155	286	Decreasing	5
		cis-1,2-DCE	4,540	5,090	5,780	No trend	70
		1,1-DCE	130	139	151	No trend	7
		vinyl chloride	1,950	1,990	2,280	No trend	2
		benzene	11.1	13.7	15.5	Decreasing	5
	MW-9B	cis-1,2-DCE	132.5	135	174	No trend	70
		vinyl chloride	1.00 U	2.40	4.44	Decreasing	2
Silurian	MW-1C	TCE	27.3	34.8	38.0	Decreasing	5
		cis-1,2-DCE	266	289	306	No trend	70
	MW-3C	1,1-DCE	182	246	288	No trend	7
		cis-1,2-DCE	16,400	20,700	28,600	No trend	70
		trans-1,2-DCE	1.00 U*	116	238	Decreasing	100
		vinyl chloride	4,230	5,660	6,300	No trend	2
		benzene	47.3	62.4	70.6	No trend	5
	MW-1D	TCE	10.85	6.56	13.7	No trend	5
		cis-1,2-DCE	92.55	49.5	109	No trend	70

*U: not detected at the reporting limit shown

Note: Values in **bold** exceed the MCL.

Although concentrations at the 95% upper confidence limit of the arithmetic mean exceeded EPA MCLs for all of the wells and contaminants in Table 5, concentration trends were generally flat or decreasing and degradation by-products were observed. No significantly increasing concentration trends were observed in monitoring wells within the contamination plume or downgradient, even at concentrations below EPA MCLs. These lines of evidence imply that the groundwater contamination plume is stable and natural attenuation is occurring.

That said, elevated concentrations and trend analyses indicate that as much as 100 years may remain to restore groundwater to EPA MCLs in the vicinity of MW-3A, -3B, and -3C. Evaluation of monitored natural attenuation during the feasibility study estimated a site average biodegradation rate constant of 0.8/year (based on the average of rate constants for TCE, DCE and vinyl chloride), and approximately 5 years to reduce the average VOC concentrations from 5,000 µg/L to 100 µg/L in the aquifers.

Therefore, optimization of the remedy may be warranted to achieve groundwater restoration within an expected, reasonable timeframe.

As recommended during the Third FYR, 1,4-dioxane analysis of groundwater from select wells was conducted during this FYR period. Of the six monitoring wells sampled for 1,4-dioxane in June 2017, and ten monitoring wells and two private wells sampled for 1,4-dioxane in November 2017, 1,4-dioxane was detected at only two monitoring well locations: source area wells MW-3B and MW-3C. Both wells continue to have concentrations of degradation products of TCE that far exceed EPA MCLs. These wells will continue to be sampled according to the monitoring plan, and the 2019 Addendum to the Third FYR recommended that the monitoring plan be modified to include sampling and analysis for 1,4-dioxane at all wells to support subsequent FYR data evaluation and analysis.

A one-mile area surrounding the Site has been designated as a protected water source pursuant to Rule 567 Iowa Administrative Code 53.7(1)(455B). The IDNR coordinates with the Linn County Health Department, the local well permitting authority, to enforce this institutional control. No COCs were detected in residential or commercial wells near the Site during the FYR period. The IDNR continues to monitor the use of Marion city well #1, located near the outer edge of the protected source area, and reported no significant changes within the FYR period. Marion city well #1 is outside the contaminated groundwater plume associated with the Site.

Consistent with another recommendation of the Third FYR, following the discovery that use of the private well nearest the Site had transitioned from residential to commercial, the IDNR required Rockwell Collins to initiate a well usage evaluation in 2016 to assist the IDNR in determining whether any action needed to be taken pursuant to Subrule 567-53.7(1) of the Iowa Administrative Code. The well usage evaluation and associated modeling effort are described in detail in Appendix G of the 2017 Remedial Action Activity Report, dated May 7, 2018, with the finding that groundwater plume stability will remain largely unimpacted by operation of this nearest private well. The 2019 Addendum to the Third FYR recommended continued water quality and usage monitoring of the water extracted by this private well, in addition to sampling of nearby monitoring wells, to verify the accuracy of these conclusions. Rockwell Collins reports continued monitoring of water usage in this well, with individual totalizer meters installed on the three water hydrants served by the well and additional metering planned if connection to a greenhouse is pursued. Presently, this nearest private well and one other private well are being sampled semiannually, and two additional private wells are being sampled annually for VOCs. During May 2018, one private well had a detection of vinyl chloride at 1.08 µg/L. This is below the MCL for vinyl chloride of 2.0 µg/L.

Dry Run Creek Surface Water and Sediment

The Third FYR found that contaminated groundwater from the Quaternary alluvial aquifer may discharge to surface water and sediment via springs along Dry Run Creek. Therefore, the Third FYR recommended that periodic sampling should occur in Dry Run Creek to determine whether surface water and sediment have been impacted by contaminated groundwater. Sampling of surface water and sediment is now occurring at least once every five years.

In the spring of 2020, six surface water samples and one duplicate, and four sediment samples and one duplicate, were collected in Dry Run Creek. The samples were analyzed for VOCs. None of the surface water samples exceeded national recommended ambient water quality criteria or EPA ecological screening levels. None of the sediment samples exceeded either the probable effect concentration (MacDonald et al., 2000) or EPA ecological screening levels for sediment. The 2020 surface water and sediment sampling data are found in Appendix C.

Vapor Intrusion

Detected groundwater COCs — benzene, 1,1-dichloroethene, trichloroethene, and vinyl chloride — are sufficiently volatile and toxic to warrant vapor intrusion evaluation. Although the volatile compounds cis-1,2-dichloroethene and trans-1,2-dichloroethene were also detected in groundwater, no inhalation toxicity data are available for these compounds. The vapor intrusion pathway was identified as a potential pathway in the 2011 FYR. In the 2013 Addendum to that FYR it was concluded that outside of property owned by Rockwell Collins, where future development will not be permitted by the owner, vapor intrusion is unlikely to occur and result in indoor air exceeding levels of concern.

To determine whether this conclusion remained valid for wells with elevated contaminant concentrations (those that had exceedances of EPA MCLs during the FYR period), groundwater data from 2020 were evaluated using the EPA's Vapor Intrusion Screening Levels (VISLs) for groundwater. Although groundwater concentrations from all depths were evaluated, consistent with previous vapor intrusion evaluations, bedrock groundwater concentrations are not expected to partition to soil vapor because they underlie 70 feet of glacial till sediments and groundwater. Of the groundwater results from the Quaternary alluvial aquifer, concentrations of TCE, 1,1-DCE, and vinyl chloride in MW-3A exceeded VISLs for both the residential and commercial exposure scenarios, and the concentration of TCE exceeded the VISL for the residential exposure scenario. Monitoring wells MW-1A and MW-3A are directly adjacent to the disposal area, near Dry Run Creek. No residences are downgradient of these wells, and based on known contaminant concentrations and flow directions in the Quaternary alluvial aquifer, no neighboring residential or commercial buildings are within 100 feet of shallow, contaminated groundwater of these concentrations. Additionally, no VOCs were detected in groundwater entering nearby buildings via water wells.

Based on this evaluation, the vapor intrusion pathway does not appear to be complete. Table 6 summarizes this evaluation. Future construction activities or significant changes in groundwater plume boundaries or concentrations may warrant additional vapor intrusion evaluation and/or mitigation.

Table 6
Comparison of Groundwater Contaminant Concentrations to
the EPA's Vapor Intrusion Screening Levels

	Well	Contaminant	May 2020 Groundwater Result (µg/L)	Groundwater VISL Residential (µg/L)	Groundwater VISL Commercial (µg/L)
Quaternary	MW-1A	Trichloroethylene	1.59	0.63	1.9
	MW-3A	Trichloroethylene	3,540	0.63	1.9
		1,1-Dichloroethylene	160	23	97
		Vinyl Chloride	531	1.7	28
Devonian	MW-1B	Trichloroethylene	3.66	0.63	1.9
	MW-2B	Vinyl Chloride	381	1.7	28
	MW-3B	Trichloroethylene	93.9	0.63	1.9
		1,1-Dichloroethylene	130	23	97
		Vinyl Chloride	1,950	1.7	28
		Benzene	11.1	17	72
	MW-9B	Vinyl Chloride	1 U	1.7	28
Silurian	MW-1C	Trichloroethylene	27.3	0.63	1.9
	MW-1D	Trichloroethylene	10.85	0.63	1.9
	MW-3C	1,1-Dichloroethylene	182	23	97
		Vinyl Chloride	4,230	1.7	28
		Benzene	47.3	17	72

Note: The groundwater VISLs are applied to shallow groundwater data as a basis for establishing a zone of inclusion for building vapor intrusion sampling. The groundwater VISLs are calculated using the following Region 7 defaults: attenuation factor 0.001, temperature 20°C, cancer risk 1×10^{-5} , hazard quotient 0.1.

Site Inspection

A site inspection was not conducted due to travel limitations associated with the COVID-19 pandemic. It is recommended that a site visit take place when travel is no longer restricted.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

The remedy is generally functioning as intended by the ROD, although optimization appears warranted. The cap covering the disposal area prevents direct contact with waste beneath the cap. The stabilization of the bank of Dry Run Creek is successful at preventing erosion. Continued maintenance of the creek bank and the cap ensures that they remain in good condition. The institutional controls described in the ROD have been implemented and have been effective.

Groundwater monitoring ensures that the extent of contaminated groundwater is delineated both vertically and horizontally, that plume expansion and migration have stabilized, that natural attenuation

of the contaminants in groundwater is occurring, and that the surface water, sediment, vapor intrusion, and residential drinking water pathways are not complete at levels of concern. However, elevated concentrations and trend analyses indicate that 100 years or more may remain before groundwater is restored to EPA MCLs under current conditions. Optimization of the groundwater remedy may support achievement of groundwater restoration within an expected, reasonable timeframe.

Remedial Action Performance

Groundwater monitoring indicates that the groundwater contamination plume is vertically and horizontally contained within the established network of 21 monitoring wells. Monitoring natural attenuation parameters with site COCs have demonstrated that natural attenuation is occurring, and conditions are favorable for it to continue to occur. These data would support an update of the conceptual site model, the calculation of an accurate monitored natural attenuation rate, and an evaluation of the need for remedy optimization to achieve a reasonable restoration timeframe.

The cap covering the disposal area prevents direct contact with waste beneath the cap. The fence and locked gate around the disposal area further prevent contact with waste and damage to the cap. The condition of the cap is monitored, and repairs are made as necessary. The stabilization of the bank of Dry Run Creek is successful at preventing erosion, and continued maintenance of the area that has been stabilized ensures that the concrete-cabled mat remains in good condition.

During the FYR period, additional investigation was conducted to verify that the private water well nearest the Site was not impacting plume stability, and that the surface water, sediment, vapor intrusion, and residential drinking water pathways were not complete at levels of concern. The 2019 Addendum to the Third FYR recommended updating monitoring requirements to include: sampling surface water and sediment in Dry Run Creek for the COCs at least once every five years; sampling groundwater for 1,4-dioxane at least once every five years; and sampling and observation of the use of wells within the protected groundwater source area. These recommendations have been implemented.

The institutional controls described in the ROD have been implemented and are effective; however, an environmental covenant recommended in the Second and Third FYRs has not been implemented.

System Operations/O&M

Since this remedy does not involve active remediation, operation and maintenance are minimal and are limited to inspection and maintenance of the disposal area cap, creek bank stabilization, and monitoring well network. During the past five years, these activities have been documented in Annual Remedial Action Activity Reports. Minor maintenance was undertaken, but no damage to the engineering controls requiring an evaluation or repair under the supervision of an Iowa-licensed Professional Engineer was documented during the FYR period. No changes in the current processes are needed in the future.

Implementation of Institutional Controls and Other Measures

The institutional controls listed in the ROD were implemented and have been effective. Although an environmental covenant was recommended in the Second and Third FYRs, and the property owner Rockwell Collins has indicated that they may consider implementation of an environmental covenant, they have not done so at this time. The EPA continues to recommend implementation of a uniform environmental covenant on the site property. This would provide a more permanent means of imposing limitations on future use of the property than the current listing on the state registry and would support a

determination of long-term protectiveness of the remedy. The IDNR must continue to monitor property use in the absence of an environmental covenant.

Absent a uniform environmental covenant, there are existing controls that limit current unacceptable exposures or uses. Specifically, Rockwell Collins' ongoing ownership of the Site allows them to control access and limit construction that might result in unacceptable exposure. They have also indicated that there are no plans to perform any construction activities on the Site. Moreover, the Site continues to be listed on the state Registry of Hazardous Waste or Hazardous Substance Disposal Sites, and the Iowa Chapter 53 Protected Groundwater Use designation within one mile of the Site continues to be in place.

The former disposal area was capped and is surrounded by a chain-link fence with a locked gate to prevent trespassers from entering the area and disturbing the cap. The fence and gate are well maintained. Areas where vehicles could enter the property surrounding the Site are also blocked by locked gates, preventing trespassers from driving onto the property.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Question B Summary:

Human Health Risk Assessment

Although there have been changes in the toxicity values for many of the site COCs since the time of remedy selection, these changes do not impact the protectiveness of the remedy. All of the cleanup levels are based on MCLs rather than risk-based values, and all remain valid.

Ecological Risk Assessment

The RAOs remain valid. The ecological risk assessment methodology has changed since the assessment was conducted for this Site, but the changes have not adversely affected the protectiveness of the remedy.

Changes in Standards and To Be Considered

No changes have occurred in the standards identified as ARARs that affect the protectiveness of the remedy. Since the baseline human health risk assessment was conducted in 1994, several toxicity values as well as risk assessment methods have changed; however, these changes do not change the conclusions of the risk assessment and do not adversely affect the protectiveness of the remedy. Finally, the EPA is not aware of any changes in land use, new human health or ecological exposure pathways or receptors, contaminants, toxic byproducts, or physical site conditions that could impact the protectiveness of the remedy.

Changes in Toxicity and Other Contaminant Characteristics

Human Health Risk Assessment

There have been no substantial changes to the toxicity factors or other contaminant characteristics that would affect the protectiveness of the remedy with respect to human health at this Site. All of the cleanup levels are based on MCLs rather than risk-based values, and all remain valid. In 2017, as follow-up from the Third FYR, six wells were sampled for the presence of 1,4-dioxane. Two wells did indicate that 1,4-dioxane was detected (1.63 µg/L and 1.35 µg/L) above the current EPA Regional Screening level of 0.46 µg/L, but those concentrations were within the acceptable target cancer risk

range of 1×10^{-4} to 1×10^{-6} . Periodic monitoring for this 1,4-dioxane was recommended and has been implemented.

Per- and polyfluoroalkyl substances (PFAS) are a group of emerging contaminants, consisting of more than 5,000 man-made fluorinated organic chemicals known for their water, oil, and stain repellency. PFAS chemistry was discovered in the late 1930s, and widespread use began in the 1950s. PFAS have historically been used in numerous industrial processes, including electroplating. Past disposal of electroplating and other industrial waste at the Site justifies a detailed evaluation based on historical records to determine whether wastes containing PFAS may have been disposed at the Site. This evaluation should determine whether historical disposal operations may have resulted in the release of PFAS to the environment and whether a sampling investigation is warranted. Even if PFAS are present, it is not anticipated that there is a current exposure pathway.

Ecological Risk Assessment

the 2019 Addendum to the Third FYR, it was determined that the concentrations of 1,4-dioxane in groundwater were significantly lower than the ecological screening level of 22,000 $\mu\text{g/L}$ in surface water. Therefore, it was determined that 1,4-dioxane is unlikely to pose an unacceptable ecological risk in Dry Run Creek.

There have not been any changes to the toxicity factors or other contaminant characteristics that affect the protectiveness of the remedy for ecological receptors at the Site.

Changes in Risk Assessment Methods

Human Health Risk Assessment

Since the Baseline Human Health Risk Assessment was completed in 1994, many advances and changes have been made to methodology for human health risk assessment. However, those changes would not alter the conclusions reached in the original risk assessment, nor would they impact the protectiveness of the Site's remedy.

Ecological Risk Assessment

The 1994 Ecological Risk Assessment (ERA) for the Site was adequate. In 1997, the EPA published Interim Final Ecological Risk Assessment Guidance for Superfund. Although the ERA for the Site was referred to as a baseline risk assessment, it was actually a screening level ecological risk assessment (SLERA). A SLERA was the appropriate action to take at the Site. This SLERA is still considered adequate because it contained the appropriate steps from the 1997 EPA guidance. Confirmed ecological risks and potential ecological risks were found at the Site via the assessment that was performed. The next step in conducting an ERA, as described in the 1997 EPA guidance, would have been to conduct a baseline ecological risk assessment, bringing unknown and known COCs forward and performing a more in-depth ERA. Rather than going through this process at the Site, the creek bank was stabilized with a geomembrane underneath, a creek crossing was installed, and the disposal area was capped. Since

2013, two sampling events (2013 and 2020) collected surface water and sediment from Dry Run Creek that confirm no unacceptable ecological risks are occurring at the Site.

Changes in Exposure Pathways

There have been no changes in exposure pathways since the Third FYR.

Expected Progress Towards Meeting RAOs

Since elevated concentrations and trend analyses indicate that 100 years or more may remain before groundwater is restored to EPA MCLs under current conditions, optimization of the groundwater remedy should be considered to determine whether groundwater remediation could occur in a timeframe more consistent with that stated in the ROD.

There have been no new site conditions identified since the Third FYR that impact RAOs or the protectiveness of the remedy.

QUESTION C: Has any **other** information come to light that could call into question the protectiveness of the remedy?

No other information has come to light during this FYR period that would call into question the protectiveness of the remedy. There are no issues related to climate change that are anticipated to directly affect the remedy at the Site.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations				
OU(s) without Issues/Recommendations Identified in the Five-Year Review:				
None				

Issues and Recommendations Identified in the Five-Year Review:				
OU(s): 01	Issue Category: Institutional Controls			
	Issue: Land use restrictions attached to the deed in the form of an environmental covenant have not been attached to the deed of the site property.			
	Recommendation: Implement an environmental covenant pursuant to the Uniform Environmental Covenants Act.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRP	State	3/31/2022

OU(s): 01	Issue Category: Other			
	Issue: PFAS are a group of emerging contaminants that were known to have been used in electroplating processes. It is unknown whether they may have been a component of waste disposed at the Site.			
	Recommendation: Conduct a detailed evaluation to determine whether wastes containing PFAS may have been disposed at the Site. If it is determined that wastes containing PFAS may have been disposed at the Site, conduct groundwater sampling for PFAS to determine whether it is present.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRP	State	12/31/2023

OTHER FINDINGS

In addition, the following are recommendations that were identified during the FYR period that do not affect current and/or future protectiveness:

- Conduct a site visit.
- Update the conceptual site model, calculate an accurate monitored natural attenuation rate, and evaluate the need for remedy optimization to achieve a reasonable restoration timeframe.

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)	
<i>Operable Unit:</i> 01	<i>Protectiveness Determination:</i> Short-term Protective
<p><i>Protectiveness Statement:</i> The remedy at the Ralston Site is protective of human health and the environment in the short-term because engineering and groundwater use controls prevent unacceptable exposure to soil and groundwater. To be protective in the long-term, the EPA continues to encourage implementation of a Uniform Environmental Covenant on the Rockwell Collins property and the presence of PFAS at the Site must be evaluated and appropriately addressed, if necessary.</p>	

VIII. NEXT REVIEW

The next FYR report for the Ralston Superfund Site is required five years from the completion date of this review.

APPENDIX A

Documents Reviewed or Referenced

APPENDIX A

Documents Reviewed or Referenced

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- Stantec Consulting Services (Stantec). 2017. 2016 Annual Remedial Action Activity Report, Former Ralston Disposal Site, Cedar Rapids, Iowa.
- Stantec. 2018. 2017 Annual Remedial Action Activity Report, Former Ralston Disposal Site, Cedar Rapids, Iowa.
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- U.S. Environmental Protection Agency (USEPA). 1994. "Final Baseline Risk Assessment for the Ralston Disposal Site, Cedar Rapids, Iowa." Prepared by CDM Federal Programs, Lenexa, Kansas.
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USEPA. June 30, 2011. “Second Five-Year Review, Ralston Site, Cedar Rapids, Iowa.”

USEPA. December 2013. “Addendum to the Second Five-Year Review Report, Ralston Site, Cedar Rapids, Iowa.”

USEPA. 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120. Office of Superfund Remediation and Technology Innovation, Washington, D.C.

USEPA. June 29, 2016. Third Five-Year Review Report for Ralston Superfund Site, Linn County, Iowa.

USEPA. September 2018a. Groundwater Statistics Tool. Excel.

USEPA. September 2018b. Groundwater Statistics Tool User’s Guide.
<https://semspub.epa.gov/work/HQ/100001733.pdf>.

USEPA. March 2019. Addendum to the Third Five-Year Review Report for the Ralston Site, Cedar Rapids, Linn County, Iowa

APPENDIX B

Table of Monitoring Well Analytical Results Since 1992

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Defections
MW-1A	07-92	5	180	170	2	1 J	<2.0	<2.0	-	None
	02-93	2 J	120	190	2 J	<10	<10	<10	-	None
	12-93	-	-	-	-	-	-	-	-	-
	08-94	-	-	-	-	-	-	-	-	-
	12-94	1.9	87.5	144	1.8	<1.0	<2.0	<1.0	-	None
	06-95	1.3	16.8	11	<1.0	<1.0	<2.0	<1.0	-	None
	09-95	2.0	34.7	42.6	<1.0	<1.0	<2.0	<1.0	-	None
	12-95	2.3	56.7	84.4	1.7	<1.0	<2.0	<1.0	-	None
	03-96	1.8	70.8	128	2.7	<1.0	<2.0	<1.0	-	None
	06-96	2.3	28.4	15.1	<1.0	<1.0	<2.0	<1.0	-	None
	09-96	2.6	33.9	20.4	<1.0	<1.0	<2.0	<1.0	-	None
	04-01	1.0	7.4	2.1	<1.0	<2.0	<1.0	<0.5	-	None
	10-01	1.3	12.1	4.3	<1.0	<2.0	<1.0	<0.5	-	None
	05-02	1.1	10.1	5.1	<1.0	<2.0	<1.0	<0.5	-	None
	10-02	1.2	9.3	5.4	<1.0	<2.0	<1.0	<0.5	-	None
	04-03	2.3	29.3	10.3	<1.0	<2.0	<1.0	<0.5	-	None
	10-03	2.13	20.3	7.13	<1.0	<2.0	<1.0	<0.5	-	None
	04-04	1.06	9.11	3.13	<1.0	<2.0	<1.0	<0.5	-	None
	10-04	1.07	11.2	3.87	<1.0	<2.0	<1.0	<0.5	-	None
	04-05	1.10	10.0	2.80	<1.0	<2.0	<1.0	<0.5	-	None
	10-05	2.13	19.6	6.06	<1.0	<2.0	<1.0	<0.5	-	None
	04-06	1.20	11.0	4.71	<1.0	<2.0	<1.0	<0.5	-	None
	04-07	1.59	17.2	20.5	<1.0	<2.0	1.75	<0.5	-	None
	04-08	1.33	8.20	3.71	<1.0	<2.0	<1.0	<0.5	-	None
	04-09	1.17	4.54	1.08	<1.0	<2.0	<1.0	<0.5	-	None
	05-10*	<1.0/<1.0	2.34/2.15	<1.0/<1.0	<1.0 C/<1.0	<2.0/<10	<1.0/<1.0	<0.5/<0.5	-	None
	04-11	<1.0	1.36	1.04	<1.0	<2.0	<1.0	<0.5	-	None
	04-12*	<1.0/<1.0	<4.0/<4.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<2.0/<2.0	<0.5/<0.5	-	None
	06-13	<1.0	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-14	<1.00	3.12	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-15	1.15	6.71	1.31	<1.00	<2.00	<1.00	<0.500	-	None
	05-16	<1.00	3.45	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-17	<1.00 UJ	<1.00 UJ	1.38 J-	<1.00 UJ	<2.00 UJ	<1.00 UJ	<0.500 UJ	<0.400	None
	05-18	<1.00	5.59	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-19	<1.00	<1.00	<1.00	<1.00	<2.00	1.46	<0.500	-	None
	05-20	<1.00	1.59	<1.00	<1.00	<2.00	<1.00	<0.500	-	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-1B	07-92	7	250	860	9	2	7	1	-	None
	02-93	<100	230	1,400	12 J	<100	<100	<100	-	None
	12-93	-	-	-	-	-	-	-	-	-
	08-94	2	60	380	3	3	<20	<2.0	-	None
	12-94	5.5	115	703	5.2	1.4	<2.0	<1.0	-	None
	06-95	3.0	27.7	35.1	<1.0	<1.0	<2.0	<1.0	-	None
	09-95	5.1	55.4	110	1.0	<1.0	<2.0	<1.0	-	None
	12-95	6.5	81.4	175	2.4	<1.0	<2.0	<1.0	-	None
	03-96	4.0	47.4	46.5	<2.0	<2.0	<2.0	<2.0	-	None
	03-96	4.0	47.4	46.5	<2.0	<2.0	<2.0	<2.0	-	None
	06-96	4.3	41.1	23.4	<1.0	<1.0	<2.0	<1.0	-	None
	09-96	5.8	56.8	40.9	<1.0	<1.0	<2.0	<1.0	-	None
	04-01	1.7	11.9	6.2	<1.0	<2.0	<1.0	<0.5	-	None
	10-01	2.0	20.3	25.7	<1.0	<2.0	<1.0	<0.5	-	None
	05-02	3.7	35.4	53.9	<1.0	<2.0	<1.0	<0.5	-	None
	10-02	2.6	21.6	21.4	<1.0	<2.0	<1.0	<0.5	-	None
	04-03	5.2	67.2	56.7	<1.0	<2.0	<1.0	<0.5	-	None
	10-03	4.98	49.0	46.7	<1.0	<2.0	<1.0	<0.5	-	None
	04-04	1.93	15.8	12.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-04	3.71	34.7	34.2	<1.0	<2.0	<1.0	<0.5	-	None
	04-05	3.45	34.1	47.9	<1.0	<2.0	<1.0	<0.5	-	None
	10-05	5.25	48.4	56.9	<1.0	<2.0	<1.0	<0.5	-	None
	04-06*	5.22/5.46	47.8/51.5	74.4/78.8	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	-	None
	04-07	3.30	26.2	72.0 M1	<1.0	<2.0	<1.0	<0.5	-	None
	04-08*	2.10/2.27	12.4/12.1	32.1/32.2	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	-	None
	04-09	3.08	15.2	18.3	<1.0	<2.0	<1.0	<0.5	-	None
	05-10	1.10	5.92	1.70	<1.0 C	<2.0	<1.0	<0.5	-	None
	04-11	1.89	12.7	8.44	<1.0	<2.0	<1.0	<0.5	-	None
	04-12	2.60	15.8	6.21	<1.0	<2.0	<2.0	<0.5	-	None
	06-13	2.84	17.8	3.68	<1.00	<2.00	<1.00	<3.00	-	None
	05-14	2.58	26.8	36.9	<1.00	<2.00	<1.00	<0.500	-	None
	05-15	3.18	21.2	25	<1.00	<1.00	<1.00	<0.500	-	None
	05-16	1.23	6.72	1.80	<1.00	<1.00	<1.00	<0.500	-	None
	06-17	<1.00 UJ	4.10 J-	1.23 J-	<1.00 UJ	<1.00 UJ	<1.00 UJ	<0.500 UJ	<0.400	None
	05-18	2.46 J-	15.8 J-	11.6 J-	<1.00 UJ	<2.00 UJ	<1.00 UJ	<0.500 UJ	-	None
	06-19	<1.00	2.60	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-20	<1.00	3.66	<1.00	<1.00	<2.00	<1.00	<0.500	<0.400	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-1C	07-92	0.6 J	65	43	0.5	2	<4.0	<4.0	-	None
	02-93	<10	45	120	1	2	4 J	140	-	None
	12-93	-	-	-	-	-	-	-	-	-
	08-94	0.4 J	74	160	1	2	<10	16	-	None
	12-94	-	66.9	181	1.2	2.3	<2.0	10.7	-	None
	06-95	<1.0	58.1	157	<1.0	2.5	<2.0	47.1	-	None
	09-95	<1.0	85.4	229	<1.0	4.0	<2.0	1	-	None
	12-95	<1.0	85.4	223	2.4	4.6	<2.0	1.1	-	None
	03-96	<2.0	63.9	174	<2.0	2.6	<2.0	<2.0	-	None
	06-96	<1.0	55.5	150	1.3	2.5	<2.0	<1.0	-	None
	09-96	<1.0	59	160	1.6	2.7	<2.0	1.8	-	None
	04-01	<1.0	67.5	248	9.4	3.5	<1.0	1.4	-	None
	10-01	<1.0	62.7	261	1.7	3.2	<1.0	0.7	-	None
	05-02	<1.0	65.6	249	1.9	3.7	<1.0	<0.5	-	None
	10-02	<1.0	62.7	230	1.7	3.2	<1.0	0.7	-	None
	04-03*	<1.0/<1.0	74.7/74.1	320/327	2.8/2.7	4.1/4.1	<1.0/<1.0	<0.5/<0.5	-	None
	10-03	<1.0	66.0	267	2.19	4.05	<1.0	<0.5	-	None
	04-04*	<1.0/<1.0	62.5/63.2	292/280	2.45/2.19	3.85/3.57	<1.0/<1.0	1.07/1.09	-	None
	10-04	<1.0	65.2	307	2.33	4.30	<1.0	<0.5	-	None
	04-05	<1.0	59.4	269	1.75	3.60	<1.0	<0.5	-	None
	10-05*	<1.0/<2.0	62.2/63	332/290**	3.03/290**	4.38/5	1.24/<2.0	<0.5/<2.0	-	None
	04-06	<1.0	59.4	271	2.18	3.62	<1.0	<0.5	-	None
	04-07	<1.0	53.2	299	3.32	3.48	<1.0	<0.5	-	None
	04-08	<1.0	50.5	299	2.35	3.84	<1.0	<0.5	-	None
	04-09	<1.0	49.4	232	1.54	3.19	<1.0	<0.5	-	None
	05-10	<1.0	52.4	295	3.04	3.19	<1.0	<0.5	-	None
	04-11	<1.0	47.0	286	1.77	3.51	<1.0	<0.5	-	None
	04-12	<1.0	40.8	251	2.96	2.93	<2.0	<0.5	-	None
	06-13	<1.00	41.4	250	1.77	3.22	<1.00	<3.00	-	None
	05-14	<1.00	40.0	293	1.73	3.48	<1.00	<0.500	-	None
	05-15	<1.00	36.9	303	2.30	3.64	<1.00	<0.500	-	None
	05-16	<1.00	34.5	286	2.29	3.30	<1.00	<0.500	-	None
	06-17*	<1.00/<1.00	32.3/30.2	284/258	1.90/1.49	3.05/3.00	<1.00/<1.00	<0.500/ <0.500	<0.400/ <0.400	None
	05-18	<1.00	35.8	326	1.96	3.40	<1.00	<0.500	-	None
	06-19	<1.00	31.1	316	2.28	4.07	<1.00	<0.500	-	None
	05-20	<1.00	27.3	266	1.57	3.05	<1.00	<0.500	<0.400	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-1D	07-92	-	-	-	-	-	-	-	-	-
	02-93	<4.0	29	61	0.7 J	0.9 J	2 J	<4.0	-	None
	12-93	0.5 J	35	130	2	1 J	<2	0.3 J	-	None
	08-94	0.2 J	31	90	1	0.8 J	0.4	<2.0	-	None
	12-94	<1.0	13.2	28.1	<1.0	<1.0	<1.0	<1.0	-	None
	06-95	<1.0	21.9	47.9	<1.0	<1.0	<2.0	<1.0	-	None
	09-95	<1.0	14.8	36.9	<1.0	<1.0	<2.0	<1.0	-	None
	12-95	<1.0	8.3	18.4	<1.0	<1.0	<2.0	<1.0	-	None
	03-96	<1.0	5.7	8.3	<1.0	<1.0	<2.0	<1.0	-	None
	06-96	<1.0	3.6	7.0	<1.0	<1.0	<2.0	<1.0	-	None
	09-96	<1.0	7.2	14.5	<1.0	<1.0	<2.0	<1.0	-	None
	04-01	<1.0	9.4	30.6	<1.0	<2.0	<1.0	<0.5	-	None
	10-01	<1.0	10.0	42.5	<1.0	<2.0	<1.0	<0.5	-	None
	05-02	<1.0	3.6	9.2	<1.0	<2.0	<1.0	<0.5	-	None
	10-02	<1.0	10.9	41.32	<1.0	<2.0	<1.0	<0.5	-	None
	04-03	<1.0	2.6	7.2	<1.0	<2.0	<1.0	<0.5	-	None
	10-03	<1.0	3.60	11.7	<1.0	<2.0	<1.0	<0.5	-	None
	04-04	<1.0	11.1	63.4	<1.0	<2.0	<1.0	<0.5	-	None
	10-04	<1.0	11.7	52.3	<1.0	<2.0	<1.0	<0.5	-	None
	04-05*	<1.0/<1.0	3.83/3.72	13.0/13.2	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	-	None
	10-05*	<1.0/<2.0	1.78/<2.0	4.94/6**	<1.0/6**	<2.0/<2.0	<1.0/<2.0	<0.5/<2.0	-	None
	04-06	<1.0	<1.0	1.80	<1.0	<2.0	<1.0	<0.5	-	None
	04-07	<1.0	3.76	21.2	<1.0	<2.0	<1.0	<0.5	-	None
	04-08	<1.0	17.3	108 M1	<1.0	<2.0	<1.0	<0.5	-	None
	04-09	<1.0	17.4	64.9	<1.0	<2.0	<1.0	<0.5	-	None
	05-10	<1.0	15.3	55.4	<1.0 C	<2.0	<2.0	<0.5	-	None
	04-11	<1.0	14.3	49.6	<1.0	<2.0	<1.0	<0.5	-	None
	04-12	<1.0	7.01	28.8	<1.0	<2.0	<2.0	<0.5	-	None
	06-13	<10.0	3.26	19.7	<1.00	<2.0	<1.0	<0.500	-	None
	05-14	<1.00	<1.00	2.47	<1.00	<2.00	<1.00	<0.500	-	None
	05-15	<1.00	3.58	26.7	<1.00	<2.00	<1.00	<0.500	-	None
	05-16	<1.00	11.7	86.9	<1.00	<2.00	<1.00	<0.500	-	None
	06-17	<1.00	12.6	90.1	<1.00	<2.00	<1.00	<0.500	<0.400	None
	05-18	<1.00	2.25	10.0	<1.00	<2.00	<1.00	<0.500	-	None
	06-19	<1.00	7.09/7.40	65.2/69.9	<1.00	<2.00	<1.00	<0.500	-	None
	05-20	<1.00	10.9/10.8	91.3/93.8	<1.00	<2.00	<1.00	<0.500	<0.400	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-2A	07-92	<10	37	110	2 J	1 J	7 J	<10	-	None
	02-93	2 J	36	88	1 J	<10	5 J	<10	-	None
	12-93	-	-	-	-	-	-	-	-	-
	08-94	-	-	-	-	-	-	-	-	-
	12-94	<1.0	15.2	41.1	<1.0	<1.0	<2.0	<1.0	-	None
	06-95	<1.0	14.8	52.7	<1.0	<1.0	3.0	<1.0	-	None
	09-95	<1.0	29.8	132	<1.0	<1.0	4.9	<1.0	-	None
	12-95	<1.0	24.2	65.5	<1.0	<1.0	<2.0	<1.0	-	None
	03-96	<1.0	19.6	40.8	<1.0	<1.0	<2.0	<1.0	-	None
	06-96	<1.0	17.4	33.0	<1.0	<1.0	<2.0	<1.0	-	None
	09-96	<1.0	31.9	109	1.4	<1.0	2.9	<1.0	-	None
	04-01	<1.0	1.5	1.8	<1.0	<2.0	<1.0	<0.5	-	None
	10-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	05-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-02	<1.0	6	18	<1.0	<2.0	<1.0	<0.5	-	None
	04-03	<1.0	5.8	3.7	<1.0	<2.0	<1.0	<0.5	-	None
	10-03	<1.0	2.52	7.25	<1.0	<2.0	<1.0	<0.5	-	None
	04-04	<1.0	1.26	2.88	<1.0	<2.0	<1.0	<0.5	-	None
	10-04	<1.0	3.41	12.4	<1.0	<2.0	<1.0	<0.5	-	None
	04-05	<1.0	1.29	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-05	<1.0	5.35	28.6	<1.0	<2.0	<1.0	<0.5	-	None
	04-06	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-07*	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	-	None
	04-08	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	05-10*	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0 C/<1.0 C	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	-	None
	04-11	<1.0	<1.0	1.35	<1.0	<2.0	<1.0	<0.5	-	None
	04-12	<1.0	<4.0	<1.0	<1.0	<2.0	<2.0	<0.5	-	None
	06-13*	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<1.00/<2.00	<1.00/<1.00	<0.500/ <0.500	-	None
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-16*	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<1.00/<2.00	<1.00/<1.00	<0.500/ <0.500	-	None
	06-17	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-18	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-19*	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<2.00/<2.00	<1.00/<1.00	<0.500/ <0.500	-	None
	05-20	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-2B	07-92	<1.0	<1.0	<1.0	<1.0	<1.0	420	<1.0	-	None
	02-93	<1.0	<1.0	<1.0	<1.0	<1.0	620	<1.0	-	None
	12-93	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	-	None
	08-94	<1.0	<1.0	<1.0	<1.0	<1.0	200	<1.0	-	None
	12-94	<1.0	<1.0	<1.0	<1.0	<1.0	362	<1.0	-	None
	06-95	<1.0	<1.0	<1.0	<1.0	<1.0	179	<1.0	-	None
	09-95	<1.0	<1.0	<1.0	<1.0	<1.0	290	<1.0	-	None
	12-95	<1.0	<1.0	<1.0	<1.0	<1.0	769	<1.0	-	None
	03-96	<1.0	<1.0	1.2	<1.0	<1.0	939	<1.0	-	None
	06-96	<1.0	<1.0	1.1	<1.0	<1.0	786	<1.0	-	None
	09-96	<1.0	<1.0	<1.0	<1.0	<1.0	572	<1.0	-	None
	04-01	<1.0	<1.0	2.0	<1.0	<2.0	625	<0.5	-	None
	10-01	<1.0	12.1	3.0	<1.0	<2.0	559	<0.5	-	1.2 ^a
	05-02	<1.0	<1.0	5.0	<1.0	<2.0	1,480	<0.5	-	None
	10-02	<1.0	<1.0	2	<1.0	<2.0	461	<0.5	-	None
	04-03*	<1.0/<1.0	<1.0/<1.0	7.7/7.8	<1.0/<1.0	<2.0/<2.0	1,000/991	<0.5/<0.5	-	6.3 ^b
	10-03	<1.0	<1.0	6.46	<1.0	<2.0	886	<0.5	-	4.87 ^b
	04-04	<1.0	<1.0	5.00	<1.0	<2.0	601	<0.5	-	0.31 ^c
	10-04*	<1.0/<1.0	<1.0/<1.0	5.53/5.32	<1.0/<1.0	<2.0/<2.0	633/523	<0.5/<0.5	-	None
	04-05	<1.0	<1.0	5.24	<1.0	<2.0	971	<0.5	-	None
	10-05*	<1.0/<1.0	<1.0/<1.0	8.58/1.05	<1.0/<1.0	<2.0/<2.0	1,010/1,030	<0.5/<0.5	-	None
	04-06	<1.0	<1.0	9.36	<1.0	<2.0	906	<0.5	-	None
	04-08	<1.0	<1.0	3.49	<1.0	<2.0	474	<0.5	-	None
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	298	<5.0	-	None
	05-10	<5.0	<5.0	<5.0	<5.0	<5.0	413	<2.5	-	None
	04-11*	<5.0/<10.0	<5.0/<10	<5.0/<10	<5.0/<10	<10/<20	375/446	<2.5/<5.0	-	None
	04-12	<1.0	<4.0	2.81	<1.0	<2.0	448	<0.5	-	None
	06-13	<1.00	<10.0	<10.0	<1.00	<2.00	797	<0.500	-	None
	05-14*	<1.00/<1.00	<1.00/<1.00	20.7/18.8	<1.00/<1.00	<2.00/<2.00	1590/1300	<0.500/ <0.500	-	None
	05-15	<1.0	<1.0	11.7	<1.0	<2.0	956	<0.500	-	None
	05-16	<1.0	<1.0	5.86	<1.0	<2.0	568	<0.500	-	None
	06-17*	<1.00/<1.00	<1.00/<1.00	2.28/2.32	<1.00/<1.00	<1.00/<1.00	209/210	<0.500/ <0.500	-	None
	05-18*	<1.00/<1.00	<1.00/<1.00	9.49/9.32	<1.00/<1.00	<2.00/<2.00	598/597	<0.500/ <0.500	-	None
	06-19	<1.00	<1.00	1.87	<1.00	<2.00	215	<0.500	-	None
	05-20	<1.00	<1.00	3.64	<1.00	<2.00	381	<0.500	-	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Defections
MW-3A	07-92	6 J	3,900	11,000	32 J	260	1,500	7 J	-	None
	02-93	<2,500	4,300	33,000	<2,500	440 J	8,900	<2,500	-	None
	12-93	-	-	-	-	-	-	-	-	-
	08-94	-	-	-	-	-	-	-	-	-
	12-94	1.2	1,670	15,000	69.2	22.5	2,420	5.8	-	None
	06-95	-	-	-	-	-	-	-	-	-
	09-95	-	-	-	-	-	-	-	-	-
	12-95	<5	883	7,760	41.2	95.2	1,330	<5.0	-	None
	03-96	<50	1,180	6,190	<50	87.0	872	<50	-	None
	07-96	<10	5,000	32,300	60.3	400.0	2,320	<10	-	None
	09-96	<10	302	7,100	42.7	83.6	814	2	-	None
	04-01	2.0	4,460	28,300	1,780	390	1,160	4.5	-	3.3 ^d
	10-01	<1.0	561	15,100	<1.0	<2.0	<1.0	3.0	-	None
	05-02*	<1.0/<500	1,690/2,200	23,500/21,000	75.0	167/<500	969/1,400	3.2/<500	-	7.4 ^d , 2.6 ^e
	10-02	<1.0	475	18,500	88.3	211	1,230	3.6	-	3.9 ^d , 8.8 ^e
	04-03	<1.0	70.6	14,600	168	<100	927	<0.5	-	5.3 ^d , 1.8 ^e , 1.1 ^f
	10-03	<1.0	173	7,080	64.7	52.2	472	1.79	-	3.96 ^d
	04-04	1.30	3,580	22,800	246	298	966	4.42	-	3.62 ^d , 8.33 ^e
	10-04	<1.0	198	8,120	58.6	78.5	640	1.78	-	1.08 ^e
	04-05	<1.0	125	6,720	44.0	44.2	518	0.96	-	2.81 ^d
	10-05*	<1.0/<100	264/220	5,910/6,700**	65.3/6,700**	42.9/<100	472/420	1.21/<100	-	3.20 ^d
	04-06	<1.0	19.2	3,860	15.1	26.0	296	<0.5	-	2.44 ^d
	04-07	<1.0	1,520	20,400	261	164	898	2.48	-	4.04 ^d
	04-08	<1.0	2,390	23,200	59.1	222	739	3.01	-	4.19 ^d
	04-09*	<5.0/<1.0	3,090/2,990	22,600/20,400	28.7/111	118/228	856/807	14.9/3.23	-	None
	05-10	<100	6,140	30,800	<100	321	1,100	<50	-	None
	04-11	<10	714	11,000	27.3	66.6	530	<5.0	-	None
	04-12	<1.00	1,900	14,600	201	126	658	2.9	-	3.29 ^d
	06-13	<1.00	2,140	12,600	110	164	555	2.04	-	2.44 ^d , 2.71 ^e
	05-14	<1.00	854	8,970	238	74.1	710	1.31	-	2.00 ^d
	05-15	<1.00	873	8,530	93.9	63.7	629	0.915	-	1.36 ^d
	05-16	<1.00	4,250	23,000	177	188	743	3.04	-	1.00 ^d , 1.57 ^d
	06-17	<1.00 U J	3,960 J-	20,400 J-	55.8 J-	153 J-	705 J-	2.75 J-	<0.400	1.37 ^d J-
	05-18*	<1.00/<1.00	820/836	7,950/8,240	36.3/49.3	64.6/65.6	405/427	1.29/1.22	-	1.97 ^d /1.87 ^d
	06-19	1.28	2,300	12,600	39.3	145	<1.00	1.63	-	1.06 ^d /1.78 ^e
	05-20	<1.00	3,540	18,600	65.6	160	531	2.26	-	1.36 ^d

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-3B	07-92	0.8 J	2,200	4,600	14	240	2,100	25	-	None
	02-93	<500	1,200	4,800	<500	200 J	1,600	62 J	-	None
	12-93	-	-	-	-	-	-	-	-	-
	08-94	<2.0	580	2,400	12	140	1,800	13	-	None
	12-94	<1.0	493	3,200	17.3	134	1,480	12.1	-	None
	06-95	<1.0	410	2,630	21.9	117	1,560	9.6	-	None
	09-95	<1.0	331	3,040	28.2	121	1,850	9.1	-	None
	12-95	<1.0	337	3,100	26.9	141	1,890	10.6	-	None
	03-96	<20	422	2,930	<20	102	1,480	<20	-	None
	07-96	<1.0	562	3,340	9.0	117	1,300	9.8	-	None
	04-01	<1.0	442	4,320	45.0	143	1,450	9.9	-	None
	10-01	1.3	269	3,900	<1.0	<2.0	<1.0	10.2	-	None
	05-02*	<1.0/<100	257/350	3,060/3,900	24.8	110/150	1,270/1,900	9.9/<100	-	None
	10-02	<1.0	375	4,910	17.6	158	1,700	16.8	-	None
	04-03	<1.0	348	5,880	75.1	157	2,490	16.8	-	None
	10-03	<1.0	247	5,790	91.4	153	2,180	16.9	-	None
	04-04	<1.0	332	5,050	46.1	142	1,830	14.1	-	None
	04-04	<1.0	332	5,050	46.1	142	1,830	14.1	-	None
	10-04	<1.0	224	4,760	22.8	124	1,990	15.8	-	0.41*
	04-05	<1.0	223	4,700	18.7	109	2,070	12.3	-	None
	10-05	<1.0	145	6,100	103	133	2,820	14.9	-	None
	04-06	<1.0	344	6,100	26.0	193	1,980	19.0	-	None
	04-07	<1.0	324	6,410	142	132	1,810	14.7	-	None
	04-08	<1.0	320	5,490	14.7	142	1,770	15.0	-	None
	04-09	<10	256	5,380	28.7	118	1,850	14.9	-	None
	05-10	<20	275	6,640	<20	<200	2,510	17.2	-	None
	04-11	<10	714	5,830	16.3	103	1,850	12.0	-	None
	04-12	<1.0	140	5,300	21.7	111	1,580	14.2	-	None
	06-13	<1.00	315	6,220	46.3	159	2,100	17.1	-	None
	05-14*	<1.00/<1.00	260/257	6120/6660	87.4/57.9	149/147	2590/2930	17.9/18.3	-	None
	05-15	<1.0	155	6,080	32.2	132	2,250	14.6	-	None
	05-16	<1.0	111	3,640	18.8	121	1,370	10.9	-	None
	06-17	<1.00 UJ	92.0 J-	4,100 J-	12.2 J-	114 J-	1,610 J-	12.2 J-	1.50	None
	11-17	-	-	-	-	-	-	-	1.63/1.35	None
	05-18	<1.00	115	4,930	14.3	141	1,730	13.2	-	None
	06-19	<1.00	97.0	4,820	18.1	167	2,140	12.7	-	None
	05-20	<1.00	93.9	4,540	14.5	130	1,950	11.1	1.95	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-3C	07-92	-	-	-	-	-	-	-	-	-
	02-93	<2.0	0.7 J	8	<2.0	6 J	3	<2.0	-	None
	12-93	-	-	-	-	-	-	-	-	-
	08-94	<2.0	0.2 J	38,000	5	200 J	9,000	<2.0	-	None
	12-94	<1.0	1.0	73,200	76.5	328	8,290	246	-	None
	06-95	-	-	-	-	-	-	-	-	-
	09-95	<1.0	1.2	204	2.1	2.6	202	<1.0	-	None
	12-95	-	-	-	-	-	-	-	-	-
	03-96	-	-	-	-	-	-	-	-	-
	07-96	-	-	-	-	-	-	-	-	-
	09-96	-	-	-	-	-	-	-	-	-
	05-01	<1.0	<1.0	15,000	286	108	9,730	54.4	-	22.6 ^f , 3.4 ^e , 23.0 ^g , 3.4 ^g
	10-01	<1.0	<1.0	37,200	119	242	6,950	79	-	None
	05-02	<1.0	1.1	38,300	303	314	7,620	100	-	3.4 ^e , 66.4 ^f
	10-02	<1.0	2.4	36,000	164	366	6,200	103	-	3 ^e , 3 ^g , 55.3 ^f
	04-03	<1.0	1.0	40,100	429	430	7,360	113	-	1.5 ^g , 2.9 ^e , 54.4 ^f
	04-04	<1.0	2.40	45,100	427	407	8,160	117	-	2.83 ^e , 1.92 ^g , 55.7 ^f
	04-05	<1.0	1.00	46,700	201	352	9,430	119	-	2.52 ^e
	10-05	<1.0	1.35	40,500	<100	347	7,100	120	-	2.89 ^e , 2.64 ^g
	04-06	<1.0	1.12	41,800	396	451	7,610	137	-	1.63 ^g , 5.17 ^e , 73.8 ^f , 3.34 ^g
	04-07	<1.0	1.26	49,300	878	346	8,000	121	-	75.0 ^f , 1.94 ^g
	04-08	<1.0	<20	40,200	111	381	8,050	121	-	1.07 ^h , 76.7 ^f
	04-09	<100	<100	28,400	<100	236	6,520	91.0	-	None
	05-10	<200	<200	35,600	<200	<2,000	9,640	<100	-	None
	04-11	<10	<10	27,100	109	216	7,520	73.4	-	None
	04-12	<20	<20	26,300	54.4	220	5,200	62.8	-	None
	06-13	<1.00	<1.00	16,100	219	194	4,700	55.4	-	1.45 ^g , 3.17 ^f
	05-14	<1.00	<1.00	16,600	197	146	5,830	50.7	-	2.83 ^g , 1.04 ^g , 2.46 ^f , 4.16 ^g
	05-15	<1.00	<1.00	27,900	180	303	6,050	78.3	-	1.88 ^g , 12.5 ^f
	05-16	<1.00	1.15	24,200	104	310	6,920	77.5	-	1.46 ^g , 1.73 ^g , 7.23 ^f
	06-17	<1.00 UJ	<1.00 UJ	27,200 J-	62.1 J-	276 J-	6,870 J-	71.0 J-	-	1.93e J-, 11.0f J-
	11-17	-	-	-	-	-	-	-	1.04	None
	05-18	<1.00	<1.00	21,400	129	285	5,190	65.3	-	1.95 ^g , 3.40 ^f
	06-19	<1.00	<1.00	16,000	36.0	271	5,450	53.6	-	1.04 ^g , 1.44 ^g , 2.60 ^f
	05-20	<1.00	<50.0	16,400	<1.00	182	4,230	47.3	0.917	1.21 ^g , 2.07 ^f

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-3D	07-92	-	-	-	-	-	-	-	-	-
	02-93	<50	58	500	<50	6 J	110	5 J	-	None
	12-93	<2.0	7	33	0.4 J	0.4 J	2	<2.0	-	None
	08-94	<2.0	3	15	0.4 J	0.4 J	7	<2.0	-	None
	12-94	<1.0	2.2	11	<1.0	<1.0	2.6	<1.0	-	None
	06-95	<1.0	2.1	6.4	<1.0	<1.0	<2.0	<1.0	-	None
	09-95	<1.0	1.2	8.1	<1.0	<1.0	3.2	<1.0	-	None
	12-95	<1.0	1.2	4.9	<1.0	<1.0	<2.0	<1.0	-	None
	03-96	<1.0	1.1	3.2	<1.0	<1.0	<2.0	<1.0	-	None
	07-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	09-96	<1.0	<1.0	2.3	<1.0	<1.0	<2.0	<1.0	-	None
	04-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-01	<1.0	<1.0	2.0	<1.0	<2.0	1.2	<0.5	-	None
	05-02	<1.0	<1.0	1.2	<1.0	<2.0	<1.0	<0.5	-	None
	10-02	<1.0	<1.0	1.2	<1.0	<2.0	<1.0	<0.5	-	None
	04-03	<1.0	<1.0	1.13	<1.0	<2.0	<1.00	<0.5	-	None
	10-03*	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	-	None
	04-04*	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	-	None
	10-04	<1.0	<1.0	1.20	<1.0	<2.0	<1.0	<0.5	-	None
	10-04	<1.0	<1.0	1.20	<1.0	<2.0	<1.0	<0.5	-	None
	04-05*	<1.0/<1.0	<1.0/<1.0	1.31/1.59	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	-	None
	10-05*	<1.0/<1.0	<1.0/<1.0	<1.0/1.05	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	-	None
	04-06*	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	-	None
	04-07	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-08	<1.0	<1.0	1.11	<1.0	<2.0	<1.0	<0.5	-	None
	04-09	<1.0	<1.0	1.64	<1.0	<2.0	<1.0	<0.5	-	None
	05-10	<1.0	1.02	5.05	<1.0	<10 M1a	1.95	<0.5	-	None
	04-11	<1.0	<1.0	2.39	<1.0	<2.0	1.31	<0.5	-	None
	04-12	<1.0	<2.0	1.56	<1.0	<2.0	<2.0	<0.5	-	None
	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-15*	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<2.00/<2.00	<1.00/<1.00	<0.500/<0.500	-	None
	05-16	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	1.60 ^a
	06-17	<1.00	<1.00	1.62	<1.00	<2.00	<1.00	<0.500	-	None
	11-17	-	-	-	-	-	-	-	<0.400	None
	05-18	<1.00	<1.00	1.72	<1.00	<2.00	<1.00	<0.500	-	None
	06-19	<1.00	<1.00	4.22	<1.00	<2.00	1.13	<0.500	-	None
	05-20	<1.00	<1.00	4.19	<1.00	<2.00	1.39	<0.500	<0.400	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-3E	12-93	<2.0	0.2 J	1 J	<2.0	<2.0	<2.0	<2.0	-	None
	08-94	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	None
	12-94	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	06-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	09-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	12-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	03-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	07-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	09-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	04-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-01	<1.0	<1.0	1.9	<1.0	<2.0	<1.0	<0.5	-	None
	05-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	-	None
	04-03	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-03	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-04*	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	-	None
	04-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-06	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-07	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-08	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	05-10	<1.0	<1.0	<1.0	<5.0	<10	<1.0	<0.5	-	None
	04-11	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-12	<1.0	<2.0	<1.0	<1.0	<2.0	<2.0	<0.5	-	None
	06-13	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<1.00/<1.00	<2.00/	<1.00/<1.00	<0.500/<0.500	-	None
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-16	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-17	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-18	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-19	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-20	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-4A	07-92	-	-	-	-	-	-	-	-	-
	07-92	-	-	-	-	-	-	-	-	-
	02-93	<2.0	<2.0	2	<2.0	<2.0	1 J	<2.0	-	None
	12-93	-	-	-	-	-	-	-	-	-
	08-94	-	-	-	-	-	-	-	-	-
	12-94	<1.0	<1.0	1.4	<1.0	<1.0	<2.0	<1.0	-	None
	06-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	09-95	<1.0	<1.0	3.2	<1.0	<1.0	<2.0	<1.0	-	None
	12-95	<1.0	<1.0	3.7	<1.0	<1.0	2.2	<1.0	-	None
	03-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	07-96	<1.0	<1.0	1.2	<1.0	<1.0	<2.0	<1.0	-	None
	09-96	<1.0	<1.0	2.4	<1.0	<1.0	<2.0	<1.0	-	None
	04-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-01	<1.0	<1.0	3.0	<1.0	<2.0	2.4	<0.5	-	None
	05-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-02	<1.0	<1.0	2.8	<1.0	<2.0	2.2	<0.5	-	None
	04-03	<1.0	<1.0	1.2	<1.0	<2.0	<1.0	<0.5	-	None
	10-03	<1.0	<1.0	3.27	<1.0	<2.0	1.93	<0.5	-	None
	04-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-04	<1.0	<1.0	3.43	<1.0	<2.0	1.64	<0.5	-	None
	04-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-05	<1.0	<1.0	2.35	<1.0	<2.0	1.63	<0.5	-	None
	04-06	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<0.5	-	None
	04-07	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-08	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	05-10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	-	None
	04-11	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-12	<1.0	<2.0	<1.0	<1.0	<2.0	<2.0	<0.5	-	None
	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-16	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-17	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	11/17	-	-	-	-	-	-	-	<0.400	None
	05-18	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-19	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-20	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	<0.400	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-4B	07-92	-	-	-	-	-	-	-	-	-
	02-93	<2.0	<2.0	0.3 J	<2.0	<2.0	0.7 J	<2.0	-	None
	12-93	-	-	-	-	-	-	-	-	-
	08-94	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	None
	12-94	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	06-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	09-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	12-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	03-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	07-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	09-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	04-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	05-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-03	<1.0	<1.0	<1.0	<1.0	<2.0	2.5	<0.5	-	None
	10-03	<1.0	<1.0	<1.0	<1.0	<2.0	1.21	<0.5	-	None
	04-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-06	<1.0	<1.0	<1.0	<1.0	<2.0	1.50	<0.5	-	None
	04-07	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-08	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	05-10	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<0.5	-	None
	04-11	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-12	<1.0	<2.0	<1.0	<1.0	<2.0	<2.0	<0.5	-	None
	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	1.46	<0.500	-	None
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-16	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-17	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	11/17	-	-	-	-	-	-	-	<0.400	None
	05-18	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-19	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-20	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	<0.400	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-4C	07-92	-	-	-	-	-	-	-	-	-
	02-93	<2.0	0.6 J	1 J	<2.0	<2.0	<2.0	<2.0	-	None
	12-93	<2.0	0.4 J	1 J	<2.0	<2.0	<2.0	<2.0	-	None
	08-94	<2.0	0.4 J	1 J	<2.0	<2.0	<2.0	<2.0	-	None
	12-94	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	06-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	None
	09-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	None
	12-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	03-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	07-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	09-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	04-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	05-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None 2 ^a
	04-03	<1.0	<1.0	1.1	<1.0	<2.0	<1.0	<0.5	-	None
	10-03	<1.0	<1.0	1.02	<1.0	<2.0	<1.0	<0.5	-	None
	04-04	<1.0	<1.0	1.48	<1.0	<2.0	<1.0	<0.5	-	None
	10-04	<1.0	<1.0	1.85	<1.0	<2.0	<1.0	<0.5	-	None
	04-05	<1.0	<1.0	1.36	<1.0	<2.0	<1.0	<0.5	-	None
	10-05	<1.0	<1.0	1.28	<1.0	<2.0	<1.0	<0.5	-	None
	04-06	<1.0	<1.0	1.70	<1.0	<2.0	<1.0	<0.5	-	None
	04-07	<1.0	<1.0	1.11	<1.0	<2.0	<1.0	<0.5	-	None
	04-08	<1.0	<1.0	1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-07	<1.0	<1.0	1.11	<1.0	<2.0	<1.0	<0.5	-	None
	04-08	<1.0	<1.0	1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	05-10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	-	None
	05-10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	-	None
	04-11	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-12	<1.0	<2.0	<1.0	<1.0	<2.0	<2.0	<0.5	-	None
	06-13	<1.0	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-16	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-17	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	11/17	-	-	-	-	-	-	-	<0.400	None
	05-18	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-19	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-20	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	<0.400	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Defections
MW-5D	12-93	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	None
	08-94	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	None
	12-94	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	06-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	None
	09-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	None
	12-95	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	03-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	07-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	09-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	04-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-03	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-03	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-06	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-07	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-08	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	05-10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	-	None
	04-11	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	06-12	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	5.69 ^b
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-16	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	1.03 ^a
	06-17	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-18	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-19	<1.00	<1.00	<1.00	<1.00	<2.00	1.23	<0.500	-	None
	05-20	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-7D	12-93	<2.0	1 J	1 J	<2.0	<2.0	<2.0	<2.0	-	None
	08-94	<2.0	4	5	<2.0	0.2 J	<2.0	<2.0	-	None
	12-94	<1.0	3.2	5.3	<1.0	<1.0	<2.0	<1.0	-	None
	06-95	<1.0	3.5	6.3	<1.0	<1.0	<1.0	<1.0	-	None
	09-95	<1.0	3.0	6.6	<1.0	<1.0	<1.0	<1.0	-	None
	12-95	<1.0	2.6	5.4	<1.0	<1.0	<2.0	<1.0	-	None
	03-96	<1.0	2.4	3.6	<1.0	<1.0	<2.0	<1.0	-	None
	06-96	<1.0	1.6	3.2	<1.0	<1.0	<2.0	<1.0	-	None
	09-96	<1.0	1.9	3.4	<1.0	<1.0	<2.0	<1.0	-	None
	04-01	<1.0	2.4	6.7	<1.0	<2.0	<1.0	<0.5	-	None
	10-01	<1.0	1.8	5.4	<1.0	<2.0	<1.0	<0.5	-	None
	04-02	<1.0	1.3	3.8	<1.0	<2.0	<1.0	<0.5	-	None
	10-02	<1.0	1.8	3.9	<1.0	<2.0	<1.0	<0.5	-	None
	04-03	<1.0	1.2	3.1	<1.0	<2.0	<1.0	<0.5	-	None
	10-03	<1.0	<1.0	2.35	<1.0	<2.0	<1.0	<0.5	-	None
	04-04	<1.0	1.22	3.44	<1.0	<2.0	<1.0	<0.5	-	None
	10-04	<1.0	1.04	3.13	<1.0	<2.0	<1.0	<0.5	-	None
	04-05	<1.0	<1.0	1.34	<1.0	<2.0	<1.0	<0.5	-	None
	10-05	<1.0	<1.0	1.40	<1.0	<2.0	<1.0	<0.5	-	None
	04-06	<1.0	<1.0	1.76	<1.0	<2.0	<1.0	<0.5	-	None
	04-07	<1.0	<1.0	1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-08	<1.0	<1.0	1.51	<1.0	<2.0	<1.0	<0.5	-	None
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-11	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-12	<1.0	<2.0	<1.0	<1.0	<2.0	<2.0	<0.5	-	None
	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-16	<1.00	<1.00	1.05	<1.00	<2.00	<1.00	<0.500	-	None
	06-17	<1.00	<1.00	3.52	<1.00	<2.00	<1.00	<0.500	-	None
	11/17	-	-	-	-	-	-	-	<0.400	None
	05-18	<1.00	<1.00	1.50	<1.00	<2.00	<1.00	<0.500	-	None
	06-19	<1.00	<1.00	3.47	<1.00	<2.00	<1.00	<0.500	-	None
	05-20	<1.00	<1.00	1.42	<1.00	<2.00	<1.00	<0.500	<0.400	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-8D	12-93	0.4 J	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	None
	08-94	0.6 J	<2.0	0.6 J	<2.0	<2.0	<2.0	<2.0	-	None
	12-94	<1.0	<1.0	1.0	<1.0	<1.0	<2.0	<1.0	-	None
	06-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	None
	09-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	None
	12-95	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	None
	03-96	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	-	None
	06-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	None
	09-96	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	None
	04-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-01	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-02	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-03	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-03*	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<1.0/<1.0	<2.0/<2.0	<1.0/<1.0	<0.5/<0.5	-	None
	04-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-04	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	10-05	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-06	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-07	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-08	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-09	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	05-10	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<0.5	-	None
	05-10	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<0.5	-	None
	04-11	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-12	<1.0	<2.0	<1.0	<1.0	<2.0	<2.0	<0.5	-	None
	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-16	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-17	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-18	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-19	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-20	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-9B	08-94	<20	110	330	3 J	95	4, J	110	-	None
	12-94	<1.0	3.6	153	<1.0	1.3	<2.0	<1.0	-	None
	06-95	<1.0	5.5	371	2.7	4.8	3.2	<1.0	-	None
	09-95	<1.0	1.6	52.6	<1.0	<1.0	<2.0	<1.0	-	None
	12-95	<1.0	<1.0	31.9	<1.0	<1.0	<2.0	<1.0	-	None
	03-96	<1.0	1.3	22.1	<1.0	<1.0	<2.0	<1.0	-	None
	06-96	<1.0	4.2	39.0	<1.0	<1.0	<2.0	<1.0	-	None
	09-96	<1.0	6.5	99.3	<1.0	1.1	<2.0	<1.0	-	None
	06-96	<1.0	4.2	39.0	<1.0	<1.0	<2.0	<1.0	-	None
	09-96	<1.0	6.5	99.3	<1.0	<2.0	<2.0	<1.0	-	None
	04-01	<1.0	5.6	500	5.8	4.8	4.6	<0.5	-	None
	10-01	<1.0	3.4	381	1.3	2.8	<1.0	<0.5	-	None
	04-02	<1.0	1.6	73.0	<1.0	<2.0	2.5	<0.5	-	None
	10-02	<1.0	4.3	366	3.3	<2.0	2.4	<0.5	-	None
	04-03	<1.0	<1.0	13.5	<1.0	<2.0	<1.0	<0.5	-	None
	10-03	<1.0	3.17	229	2.00	3.21	17.0	<0.5	-	None
	04-04	<1.0	4.90	646	4.08	6.23	8.26	<0.5	-	None
	10-04	<1.0	1.89	225	1.69	2.35	<1.0	<0.5	-	None
	04-05	<1.0	2.09	82.7	<1.0	<2.0	5.43	<0.5	-	None
	10-05	<1.0	2.09	36.6	<1.0	<2.0	<1.0	<0.5	-	None
	04-06	<1.0	1.21	19.1	<1.00	<2.0	3.88	<0.5	-	None
	04-07*	<1.0/<1.0	4.84/4.83	981/874	7.97/9.96	9.14/8.29	10.4/10.0	<0.5/<0.5	-	None
	04-08*	<1.0/<1.0	2.44/2.48	498/499	2.83/23.46	5.12/5.41	19.5/19.2	<0.5/<0.5	-	None
	04-09*	<1.0/<1.0	1.59/1.58	233/241	1.02/<1.0	2.36/2.30	13.5/15.0	<0.5/<0.5	-	None
	05-10	<5.0	<5.0	205	<5.0	<50	17.8	<2.5	-	None
	04-11*	<1.0/<1.0	1.58/1.45	193 /211	<1.0/<1.0	2.25/2.45	24.2/23.5	<0.5/<0.5	-	None
	04-12*	<1.0/<1.0	<2.0/2.0	258 B B1/230	1.72/1.47	2.32/2.1	17.7/15.4	<0.5/<0.5	-	None
	06-13	<1.00	2.26	91.5 B	2.40	<2.00	1.99	<0.500	-	None
	05-14	<1.00	<1.00	37.4	<1.00	<2.00	3.48	<0.500	-	None
	05-15*	<1.00/<1.00	2.01/1.55	161 B/141 B	10.7/12.8	<2.00/<2.00	3.58/2.45	<0.500/ <0.500	-	None
	05-16	<1.00	<1.00	187	6.03	<2.00	3.18	<0.500	-	None
	06-17	<1.00	<1.00	225	5.43	<2.00	3.98	<0.500	-	None
	11/17	-	-	-	-	-	-	-	<0.400	None
	05-18	<1.00	1.99	107	1.13	<2.00	<1.00	<0.500	-	None
	06-19	<1.00	<1.00	136	<1.00	<2.00	<1.00	<0.500	-	None
	05-20	<1.00/<1.00	<1.00/<1.00	140 /125	<1.00/<1.00	<2.00/<2.00	<1.00/<1.00	<0.500/<0.500	<0.400/<0.400	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Defections
MW-9D	08-94	<2.0	5	12	<2.0	0.2 J	<2.0	<2.0	-	None
	12-94	<1.0	4.2	11.1	<1.0	<1.0	<1.0	<1.0	-	None
	06-95	<1.0	6.0	16.3	<1.0	<1.0	<1.0	<1.0	-	None
	09-95	<1.0	5.2	17.8	<1.0	<1.0	<1.0	<1.0	-	None
	12-95	<1.0	5.5	18.7	<1.0	<1.0	<1.0	<1.0	-	None
	06-96	<1.0	5.9	14.8	<1.0	<1.0	<2.0	<1.0	-	None
	09-96	<1.0	<1.0	13.2	<1.0	<1.0	<2.0	5.2	-	None
	04-01	<1.0	4.3	14.2	<1.0	<2.0	<1.0	<0.5	-	None
	10-01	<1.0	3.6	17.0	<1.0	<2.0	<1.0	<0.5	-	None
	04-02	<1.0	5.3	19.5	<1.0	<2.0	<1.0	<0.5	-	None
	10-02	<1.0	5.3	21	<1.0	<2.0	<1.0	<0.5	-	None
	04-03	<1.0	5.0	20.3	<1.0	<2.0	<1.0	<0.5	-	None
	10-03	<1.0	3.99	21.2	<1.0	<2.0	<1.0	<0.5	-	None
	04-04	<1.0	5.09	32.3	<1.0	<2.0	<1.0	<0.5	-	None
	10-04	<1.0	5.60	34.4	<1.0	<2.0	<1.0	<0.5	-	None
	04-05	<1.0	4.50	23.2	<1.0	<2.0	<1.0	<0.5	-	None
	10-05	<1.0	5.20	23.2	<1.0	<2.0	<1.0	<0.5	-	None
	04-06	<1.0	3.04	11.4	<1.0	<2.0	<1.0	<0.5	-	None
	04-07	<1.0	3.56	20.7	<1.0	<2.0	<1.0	<0.5	-	None
	04-08	<1.0	4.17	29.1	<1.0	<2.0	<1.0	<0.5	-	None
	04-09	<1.0	3.78	24.1	<1.0	<2.0	<1.0	<0.5	-	None
	05-10	<1.0	4.40	33.1	<1.0	<1.0	<1.0	<0.5	-	None
	04-11	<1.0	3.75	20.5	<1.0	<2.0	<1.0	<0.5	-	None
	04-12	<1.0	3.28	18.8 B B1	<1.0	<2.0	<2.0	<0.5	-	None
	06-13	<1.00	1.77	10.3	<1.00	<2.00	<1.00	<0.500	-	None
	05-14	<1.00	1.69	9.23	<1.00	<2.00	<1.00	<0.500	-	None
	05-15	<1.00	2.36	23.6 B	<1.00	<2.00	<1.00	<0.500	-	None
	05-16*	<1.00/<1.00	2.96/2.91	28.3/26.6	<1.00/<1.00	<2.00/<2.00	<1.00/<1.00	<0.500/ <0.500	-	None
	06-17	<1.00	2.12	21	<1.00	<2.00	<1.00	<0.500	-	None
	11/17	-	-	-	-	-	-	-	<0.400	None
	05-18	<1.00	2.38	15.2	<1.00	<2.00	<1.00	<0.500	-	None
	06-19	<1.00	2.36	25.6	<1.00	<2.00	1.33	<0.500	-	None
	05-20	<1.00	1.95	29.4	<1.00	<2.00	<1.00	<0.500	<0.400	None

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
MW-10B	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-16	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-17	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	11/17	-	-	-	-	-	-	-	<0.400	None
	05-18	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-19	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-20	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	<0.400	None
MW-11B	06-13	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-14	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-15	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-16	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-17	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-18	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	06-19	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
	05-20	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<0.500	-	None
Groundwater Action Level		5	5	70	NE	7	2	5	NE	NE

Notes:

Concentrations are presented in microgram(s) per liter (µg/L).

< = Less than.

B = Analyte was detected in the associated method blank.

B1 = Analyte was detected in the associated method blank. Analyte concentration in the sample is greater than 10x the concentration found in the method blank.

C = Calibration verification recovery was above the method control limit for this analyte. Analyte not detected, data not impacted.

J = Analyte reported below detection limit and is an estimated value.

M1 (2007, 2008 data) = The MS (matrix spike) and/or MSD (matrix spike duplicate) were outside control limits.

M1a (2010 data) = The MS and/or MSD were outside control limits.

- Indicates sample was not collected.

J- = The analyte was positively identified; the quantitation is an estimation with a potential low bias.

UJ = The analyte was analyzed for, but not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the sample quantitation limit.

* Duplicate sample collection designations are as follows:

MW-1A; 05-10; blind duplicate sample collected from MW-1A; labeled as MW-1E (duplicate sample indicated second).

MW-1A; 04-12; blind duplicate sample collected from MW-1A; labeled as MW-1E (duplicate sample indicated second).

MW-1B; 04-06; blind duplicate sample collected from MW-1B, labeled as MW-1E (duplicate sample indicated second).

MW-1B; 04-08; blind duplicate sample collected from MW-1B, labeled as MW-2C (duplicate sample indicated second).

MW-1C; 04-03; blind duplicate sample collected from MW-1C, labeled as MW-1E (duplicate sample indicated second).

MW-1C; 04-04; blind duplicate sample collected from MW-1C, labeled as MW-2C (duplicate sample indicated second).

MW-1C; 10-05; Iowa Department of Natural Resources (IDNR) split result.

MW-1C; 06-17; blind duplicate sample collected from MW-1C, labeled as MW-1E (duplicate sample indicated second).

TABLE 4-4

**HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA**

Well ID	Sample Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride	Benzene	1,4-Dioxane	Other VOC Detections
Notes (continued):										
	MW-1D, 04-05;	blind duplicate sample collected from MW-1D, labeled as MW-1E (duplicate sample indicated second).								
	MW-1D, 10-05;	IDNR split sample result.								
	MW-1D, 06-19;	blind duplicate sample collected from MW-1D, labeled as MW-1E (duplicate sample indicated second).								
	MW-1D, 05-20;	blind duplicate sample collected from MW-1D, labeled as MW-1E (duplicate sample indicated second).								
	MW-2A, 04-07;	blind duplicate sample collected from MW-2A, labeled as MW-2C (duplicate sample indicated second)								
	MW-2A; 05-10;	blind duplicate sample collected from MW-2A; labeled as MW-2C (duplicate sample indicated second)								
	MW-2A; 06-13;	blind duplicate sample collected from MW-2A labeled as MW-2C (duplicate sample indicated second).								
	MW-2A; 05-16;	blind duplicate sample collected from MW-2A; labeled as MW-2C (duplicate sample indicated second)								
	MW-2A; 06-19;	blind duplicate sample collected from MW-2A; labeled as MW-2C (duplicate sample indicated second)								
	MW-2B, 04-03;	blind duplicate sample collected from MW-2B, labeled as MW-2C (duplicate sample indicated second).								
	MW-2B, 10-04;	blind duplicate sample collected from MW-2B, labeled as MW-2C (duplicate sample indicated second).								
	MW-2B, 10-05;	blind duplicate sample collected from MW-2B, labeled as MW-2C (duplicate sample indicated second).								
	MW-2B, 04-11;	blind duplicate sample collected from MW-2B, labeled as MW-2C (duplicate sample indicated second).								
	MW-2B, 05-14;	blind duplicate sample collected from MW-2B, labeled as MW-2C (duplicate sample indicated second).								
	MW-2B; 05-18;	blind duplicate sample collected from MW-2B; labeled as MW-2C (duplicate sample indicated second)								
	MW-3A, 05-02;	IDNR split sample result.								
	MW-3A, 10-05;	IDNR split sample result.								
	MW-3A, 04-09;	blind duplicate sample collected from MW-3A, labeled as MW-2C (duplicate sample indicated second).								
	MW-3A, 04-09;	blind duplicate sample collected from MW-3A, labeled as MW-2C (duplicate sample indicated second).								
	MW-3A, 05-18;	blind duplicate sample collected from MW-3A, labeled as MW-1E (duplicate sample indicated second).								
	MW-3B, 05-02;	IDNR split sample result.								
	MW-3B, 05-14;	blind duplicate sample collected from MW-3B, labeled as MW-1E (duplicate sample indicated second).								
	MW-3B, 11-17;	blind duplicate sample collected from MW-3B, labeled as MW-1E (duplicate sample indicated second).								
	MW-3D, 10-03;	blind duplicate sample collected from MW-3D, labeled as MW-2C (duplicate sample indicated second).								
	MW-3D, 04-04;	blind duplicate sample collected from MW-3D, labeled as MW-1E (duplicate sample indicated second).								
	MW-3D, 04-05;	blind duplicate sample collected from MW-3D, labeled as MW-2C (duplicate sample indicated second).								
	MW-3D, 10-05;	blind duplicate sample collected from MW-3D, labeled as MW-1E (duplicate sample indicated second).								
	MW-3D, 04-06;	blind duplicate sample collected from MW-3D, labeled as MW-2C (duplicate sample indicated second).								
	MW-3D, 06-13;	blind duplicate sample collected from MW-3D, labeled as MW-1E (duplicate sample indicated second).								
	MW-3D, 05-15;	blind duplicate sample collected from MW-3D, labeled as MW-2C (duplicate sample indicated second)								
	MW-3E, 10-04;	blind duplicate sample collected from MW-3E, labeled as MW-1E (duplicate sample indicated second).								
	MW-8D, 10-03;	blind duplicate sample collected from MW-8D, labeled as MW-1E (duplicate sample indicated second).								
	MW-9B, 04-07;	blind duplicate sample collected from MW-9B, labeled as MW-1E (duplicate sample indicated second).								
	MW-9B, 04-08;	blind duplicate sample collected from MW-9B, labeled as MW-1E (duplicate sample indicated second).								
	MW-9B, 04-09;	blind duplicate sample collected from MW-9B, labeled as MW-1E (duplicate sample indicated second).								
	MW-9B, 04-11;	blind duplicate sample collected from MW-9B, labeled as MW-2C (duplicate sample indicated second).								
	MW-9B, 05-15;	blind duplicate sample collected from MW-9B, labeled as MW-1E (duplicate sample indicated second).								
	MW-9B, 05-20;	blind duplicate sample collected from MW-9B, labeled as MW-2C (duplicate sample indicated second).								
	MW-9D, 05-16;	blind duplicate sample collected from MW-9D, labeled as MW-1E (duplicate sample indicated second).								

TABLE 4-4

HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Well ID	Sample		Tetrachloroethene	Trichloroethene	cis-1,2-	trans-1,2-	1,1-	Vinyl	Benzene	1,4-Dioxane	Other VOC Detections
	Date				Dichloroethene	Dichloroethene	Dichloroethene	Chloride			

Notes (continued):

** Result is total 1,2-Dichloroethene (DCE).

^a Carbon disulfide.

^b Chloroethane.

^c Carbon tetrachloride.

^d 1,2-Dichlorobenzene.

^e 1,1-Dichloroethane

^f Toluene.

^g 1,2-Dichloroethane.

^h Ethylbenzene

ⁱ Bromomethane

NE = Groundwater Action Level not established (Record of Decision – September 1999).

APPENDIX C

2020 Surface Water and Sediment Sampling Data

TABLE 4-7

**SUMMARY DATA - SURFACE WATER SAMPLING
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA**

Compound	Well ID: Sample Date: Units	DRC01- SW-0520 5/7/2020	DRC02- SW-0520 5/7/2020	DRC03- SW-0520 5/7/2020	DRC04- SW-0520 5/7/2020	DRC05- SW-0520 (DUP)* 5/7/2020	DRC06- SW-0520 5/7/2020	DRC07- SW-0520 5/7/2020
Acetone	µg/L	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Benzene	µg/L	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
Bromodichloromethane	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Bromoform	µg/L	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
Bromomethane	µg/L	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00
2-Butanone	µg/L	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Carbon disulfide	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Carbon tetrachloride	µg/L	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Chlorobenzene	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chlorodibromomethane	µg/L	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
Chloroethane	µg/L	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00
Chloroform	µg/L	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
Chloromethane	µg/L	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
1,2-Dichlorobenzene	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,4-Dichlorobenzene	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethane	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichloroethane	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethene	µg/L	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
cis-1,2-Dichloroethene	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
trans-1,2-Dichloroethene	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichloropropane	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
cis-1,3-Dichloropropene	µg/L	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
trans-1,3-Dichloropropene	µg/L	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
Ethylbenzene	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
2-Hexanone	µg/L	<10.0 *	<10.0 *	<10.0 *	<10.0	<10.0	<10.0	<10.0
4-Methyl-2-pentanone	µg/L	<10.0 *	<10.0 *	<10.0 *	<10.0	<10.0	<10.0	<10.0
Methylene chloride	µg/L	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
Methyl-tert-butyl Ether (MTBE)	µg/L	<1.00 *	<1.00 *	<1.00 *	<1.00	<1.00	<1.00	<1.00

TABLE 4-7

SUMMARY DATA - SURFACE WATER SAMPLING
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS, IOWA

Compound	Well ID: Sample Date: Units	DRC01 - SW-0520 5/7/2020	DRC02 - SW-0520 5/7/2020	DRC03 - SW-0520 5/7/2020	DRC04 - SW-0520 5/7/2020	DRC05 - SW-0520 (DUP)* 5/7/2020	DRC06 - SW-0520 5/7/2020	DRC07 - SW-0520 5/7/2020
Naphthalene	µg/L	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
1,1,2,2-Tetrachloroethane	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Tetrachloroethene	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Toluene	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,1-Trichloroethane	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,2-Trichloroethane	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Trichloroethene	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Vinyl chloride	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Xylenes, Total	µg/L	<3.00 *	<3.00 *	<3.00 *	<3.00	<3.00	<3.00	<3.00

Notes:

DRC05-SW-0613 (DUP) is a blind duplicate of DRC04-SW-0613 and DRC04-SW-0520.

µg/L = Microgram(s) per liter.

* = Laboratory Control Spike (LCS) or Laboratory Control Spike Duplicate (LCSD) exceeds the control limits.

TABLE 4-8

SEDIMENT SAMPLE DATA SUMMARY
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS

Compound	Well ID:	DRC01-SD-0520	DRC02-SD-0520	DRC03-SD-0520	DRC04-SD-0520	DRC05-SD-0520
		Sample Date:	Sample Date:	Sample Date:	Sample Date:	(DUP)
	Units	5/7/2020	5/7/2020	5/7/2020	5/7/2020	5/7/2020
Acetone	µg/kg	<134	<146	<137	<124	<133 F1
Benzene	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
Bromodichloromethane	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3 F2
Bromoform	µg/kg	<26.8	<29.2	<27.4	<24.8	<26.7 F2
Bromomethane	µg/kg	<53.6	<58.5	<54.8	<49.5	<53.4
2-Butanone	µg/kg	<53.6	<58.5	<54.8	<49.5	<53.4
Carbon disulfide	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
Carbon tetrachloride	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3 F2
Chlorobenzene	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
Chlorodibromomethane	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3 F2
Chloroethane	µg/kg	<53.6	<58.5	<54.8	<49.5	<53.4
Chloroform	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
Chloromethane	µg/kg	<53.6	<58.5	<54.5	<49.5	<53.4
1,2-Dichlorobenzene	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3 F2
1,3-Dichlorobenzene	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3 F2
1,4-Dichlorobenzene	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3 F2
1,1-Dichloroethane	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
1,2-Dichloroethane	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
1,1-Dichloroethene	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
cis-1,2-Dichloroethene	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
trans-1,2-Dichloroethene	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
1,2-Dichloropropane	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
cis-1,3-Dichloropropene	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3 F2
trans-1,3-Dichloropropene	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3 F2
Ethylbenzene	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
2-Hexanone	µg/kg	<53.6	<58.5	<54.8	<49.5	<53.4
4-Methyl-2-pentanone	µg/kg	<53.6	<58.5	<54.8	<49.5	<53.4
Methylene chloride	µg/kg	<134	<146	<137	<124	<133
Methyl-tert-butyl Ether (MTBE)	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3

TABLE 4-8
SEDIMENT SAMPLE DATA SUMMARY
FORMER RALSTON DISPOSAL SITE - CEDAR RAPIDS

Compound	Well ID:	DRC01-SD-0520	DRC02-SD-0520	DRC03-SD-0520	DRC04-SD-0520	DRC05-SD-0520 (DUP)
	Sample Date:	5/7/2020	5/7/2020	5/7/2020	5/7/2020	5/7/2020
	Units					
Naphthalene	µg/kg	<66.9	<73.1	<68.4	<61.9	<66.7 F2
1,1,2,2-Tetrachloroethane	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
Tetrachloroethene	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
Toluene	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
1,1,1-Trichloroethane	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
1,1,2-Trichloroethane	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
Trichloroethene	µg/kg	<13.4	<14.6	<13.7	<12.4	<13.3
Vinyl chloride	µg/kg	<26.8	<29.2	<27.4	<24.8	<26.7
Xylenes, Total	µg/kg	<26.8	<29.2	<27.4	<24.8	<26.7

Notes:

DRC05-SW-0520 (DUP) is a blind duplicate of DRC02-SW-0520.

µg/kg = Microgram(s) per kilogram.

F1 = MS and/or MSD recovery exceeds control limits.

F2 = MS/MSD Relative Percent Difference (RPD) exceeds control limits.

FIGURE 1

Site Map



LEGEND:

- MONITORING WELL
- ⊕ PRIVATE WELL
- EXTENT OF DISPOSAL CAP
- - - FENCE

DESIGNED BY	ROB MALCOMSON	9/12/2018
DRAWN BY	SCOTT HANSEN	9/12/2018
CHECKED BY	ROB MALCOMSON	9/12/2018
APPROVED BY	STEVE VARSA	9/12/2018
CLIENT APPROVAL		
CLIENT REFERENCE NO.		

0 150 300
SCALE IN FEET

PROJECT LOCATION	DES MOINES, IOWA
PROJECT	FORMER RALSTON DISPOSAL SITE CEDAR RAPIDS, IOWA
TITLE	SITE MAP

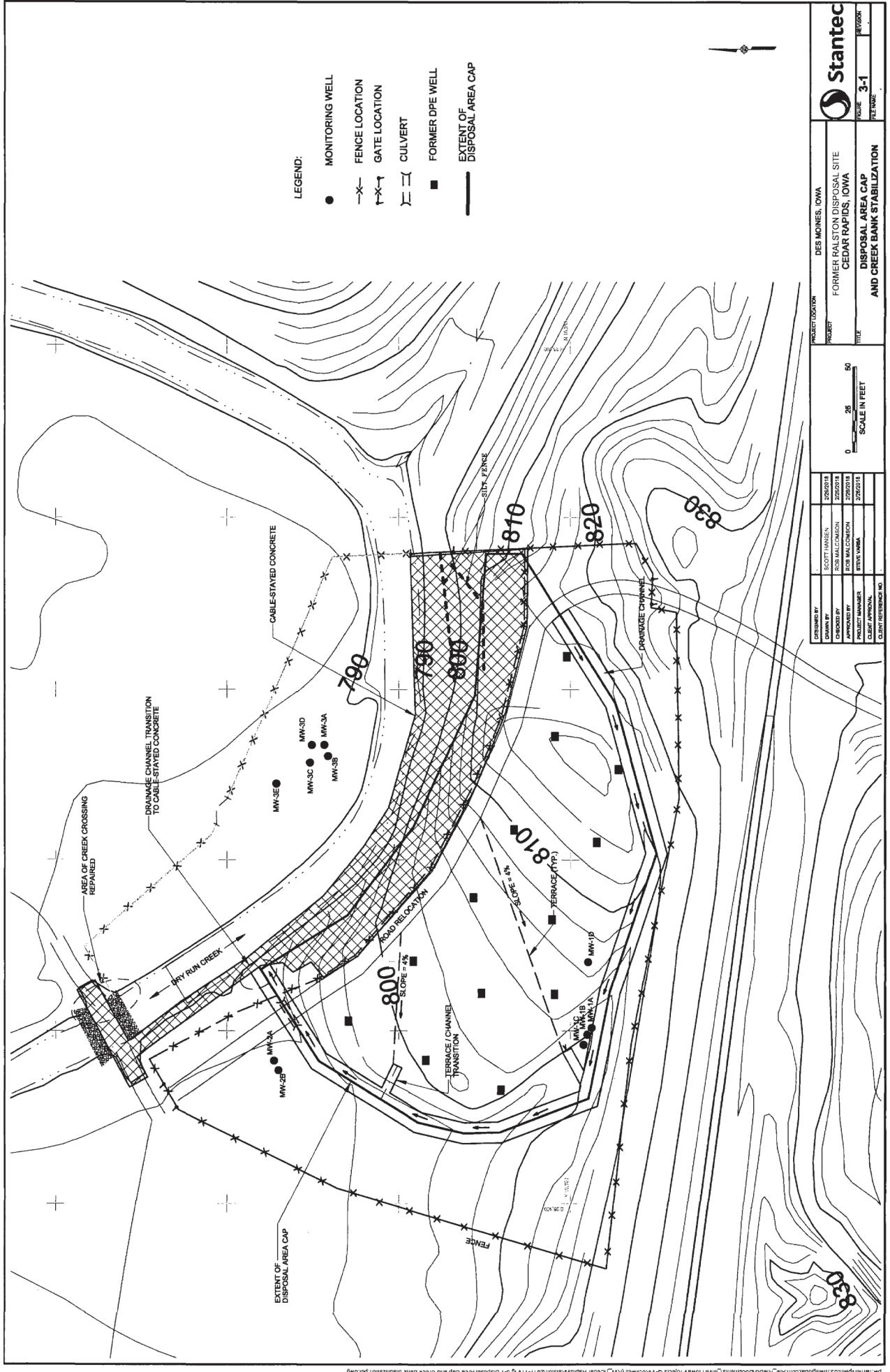
	Stantec
FIGURE	2-2
REVISION	

FIGURE 2

Site Access Map

FIGURE 3

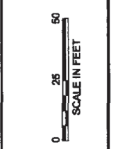
Disposal Area Cap and Creek Bank Stabilization



LEGEND:

- MONITORING WELL
- X- FENCE LOCATION
- X- GATE LOCATION
- X- CULVERT
- FORMER DPE WELL
- EXTENT OF DISPOSAL AREA CAP

DESIGNED BY	SCOTT HANSEN	2/26/2018
DRAWN BY	ROB MALCOLMSON	2/26/2018
CHECKED BY	ROB MALCOLMSON	2/26/2018
PROJECT MANAGER	ETHEL VANDER	2/26/2018
CLIENT APPROVAL		
CLIENT REFERENCE NO.		



PROJECT LOCATION	DES MOINES, IOWA
PROJECT	FORMER RALSTON DISPOSAL SITE CEDAR RAPIDS, IOWA
TITLE	DISPOSAL AREA CAP AND CREEK BANK STABILIZATION
FILE NAME	3-1
REVISION	



FIGURE 4

Protected Source Water Area

Figure 4
Protected Source Water Area

